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The Shippers and the Commission

The Interstate Commerce Commission and its attorney in the rate advance case, Mr. Brandeis, stirred up a hornet's nest when they injected the industrial railways matter into the rate advance case. Mr. Brandeis was very influential in defeating general advances in rates three years ago. Then, in the estimation of the large shippers, he was one of the saviors of his country. Now, to them, he is Beelzebub. Until within recent weeks, according to the shippers, the Interstate Commerce Commission was the people's great tribunal—a present help to the dear public in every time of trouble. Now the commission is anathema; and the shippers talk of appealing to Congress to protect them from its tyrannical depredations. Until recently the shippers said that the right of appeal to the courts from the decisions of the commission should be narrowly restricted. Now they denounce the Act to Regulate Commerce because they can't appeal from the commission to the courts regarding any opinion the commission may finally express concerning charges for the "spotting" of cars, and so on. For years railway men have been complaining about regulation and the shippers have been denouncing the railway men for being so unreasonable. Now the complaints that the shippers are sending up to high heaven about the regulation which they merely fear exceed in earsplitting shrillness any complaints that the railways have ever sent up regarding things that actually have been done. The railway man appeals to the shippers to please not make him laugh because he has a sore lip; but nevertheless they keep right on so conducting themselves that the railway man bursts with merriment. Really, though, funny as the situation is, there is nothing surprising about the shippers' attitude. They are merely showing that they are human. The railway men have been crying out in pain because the government has been putting the thumb screws to them. The shippers are now crying out for the same reason. The bankers likewise cried out a few months ago when they were apprehensive regarding proposed currency regulation. Each of these classes should be better able now than heretofore to sympathize with the railway man's point of view regarding public regulation.

Investor Versus Speculator

There have been various published guesses as to what form the reorganization of the holding companies for the Chicago, Rock Island & Pacific Railway will take. The latest, published in *The Wall Street Journal*, with the earmarks of a guess based on an interview with some one closely connected with the various interests involved, suggests that the holders of the collateral trust 4 per cent. Railroad company bonds will have to submit to an assessment. This would be fair enough if the holding company stockholders and holders of Railroad 4's were in the same class of "capitalists," but they are not. The Railway company stock was deposited under an agreement of 1902 by which there was issued in exchange an equal amount, par value, of Railroad 4 per cent. bonds and, in addition, $70 of preferred stock and $100 of common stock of the Rock Island Company. The preferred stock carried with it voting rights which gave it control of the entire concern. The speculators bought Rock Island preferred and common and the Railroad 4's were held out as an investment and in good part sold to investors, undiscriminating, perhaps, but still in an utterly different class from the Moore-Reid syndicate whose influence in Rock Island affairs is comparable to that of B. F. Yoakum in Frisco affairs. If the majority of the holders of Railroad 4's can get together, insist on their right to foreclose on the Railway company stock, and public opinion is strong enough to prevent some such arrangement as the sale of the Railway company stock as a whole, and if these holders are willing, as they should be, to forego an interest return on their investment for a few years, it would appear as if there was an unusually good opportunity to compel the holders of the voting device certificates to make some real investment in the property.

A Not Entirely Forgotten Incident

There is another side from which to view this question of a reorganization. Justice unequivocally demands that the interests of the Railway company bond and debenture holders should be protected. Their securities were sold to them as an investment pure and simple, without speculative possibility of profit or of loss. In 1909 the Railroad company sold its holdings of St. Louis & San Francisco stock to B. F. Yoakum and associates and took a $7,500,000 loss through the retirement of the collateral trust bonds when the security for them—Frisco stock—was disposed of. This loss belonged on the shoulders of the holding company stockholders, but was in a sense passed along

to the security holders of the Railway company through the sale by the Railroad company of $7,500,000 5 per cent. bonds, unsecured, to the Railway company. *The Railroad company has been paying interest to the Railway company on these bonds from the dividends received on the Railway company stock.* The purchase of control of the Frisco by the directors of the Rock Island Company was a speculation which turned out badly. The speculators ought to have to bear the burden of their own mistake; and neither should the Railway company security holders have their equity in any way impaired, nor should the holders of Railroad collateral 4's be made to suffer.

Promotion of Engineers in Railway Service

There exists a general feeling among engineers in railway service that there is little opportunity for them for promotion into the operating department, and because of this feeling many engineers leave the railways to enter other lines of industry. While it is true that there is small opportunity for promotion on many roads, this condition is not universal and is growing less general. A glance through the arrangements of promotions in our columns for the past few months will give much encouragement to engineers. For instance, in the last three months presidents have been selected for the New York Central Lines, the Atlantic Coast Line, the Northwestern Pacific, and the Nashville, Chattanooga & St. Louis, all of whom received their early training in the engineering department. Two vice-presidents with similar experience have been selected in the same period, as have also two general managers, one assistant general manager, one general superintendent and one assistant general superintendent. In the same interval nine division engineers and engineers of maintenance of way have been promoted to division superintendents of important roads, including the Pennsylvania Railroad; Pennsylvania Lines; Northern Pacific; Atlantic Coast Line; Central Railroad of New Jersey and Chesapeake & Ohio.

TERMINAL SERVICES AND THE RATE ADVANCE CASE

NO question ever raised by the Interstate Commerce Commission has stirred up a greater storm than that regarding the propriety of the terminal services that the railways now render free to some shippers and the payments they make to some others for rendering these services to themselves. The impression was given by the commission's recent opinion in the Industrial Railways case, and its announcement of a hearing on the general subject of terminal charges and allowances, that it probably would indicate that the railways might and should cease to pay shippers terminal allowances and should begin to charge for all switching of cars on sidings. Consequently, the hearing before Commissioner Harlan in Washington on February 27 and 28 was attended by representatives of large industrial concerns and commercial organizations from all over the East to enter heated protest against the action feared.

In order intelligently to consider the questions involved it is necessary to get down to fundamentals regarding the service which American railways render and should render in the transportation of freight. Manifestly, it is the place of the shipper to deliver the freight to the railway for transportation. Manifestly, it is a part of the railway's ordinary service for it to deliver the freight to the consignee. If the railway renders any service to the shipper preceding the actual delivery of the freight to it, or any service to the consignee subsequent to the actual delivery of the freight to him, then, plainly, the railway should receive a reward for this special service additional to the payment it receives for the ordinary service of transportation.

What, then, is delivery by the shipper to the railway? And what is delivery by the railway to the consignee? It would seem that the general practice followed should be determinative of these points. Now, ordinarily, the delivery of less-than-carload freight to the railway consists in the bringing of it to the freight house of the railway by the shipper or his agent. If, then, the railway adopts the practice of sending cars, or lighters, or other vehicles, to the plants of only a few shippers and of bringing back their goods to its freight house without making any extra charge for the service, it is guilty of unfair discrimination against all other shippers. The same thing must be true if, instead of rendering this special service to the shipper, the railway pays him or somebody else for rendering it.

As to carload freight, delivery is ordinarily either the placing of the car at a point on the railway's team track which will be convenient for the shipper, or the placing of the car on the shipper's side-track—if he has one—at a point at no considerable distance from the railway's track. Cars placed on sidings ordinarily are not moved far from the railway's right of way because most sidings are short. Is it an unfair discrimination for the railway to place the freight of one shipper who has no private siding on a team track where he must come to get it, and that of another shipper who has a siding on this shipper's siding without making against the latter any charge additional to that for the road haul? Manifestly, if a shipper is so situated that he can have a private siding it is more advantageous to him for his cars to be placed on it than for them to be put on team tracks. But, on the other hand, it is very doubtful if ordinarily it is any more expensive—or even as expensive—for the railway merely to set a car on a private siding than it is to own and maintain team tracks and set cars on them. Therefore, the mere placing of cars on sidings for shippers who have them without extra charge does not seem an unfair discrimination against shippers without sidings.

Suppose, however, that instead of having a mere siding the shipper has in his plant an industrial railway with several miles of tracks, and that instead of merely placing the car at a point on the industrial railway where it will be convenient for the consignee to receive it, the railway sends its engine into the plant and places the cars at any point which the shipper may designate. It seems manifest that in that case the railway has not made merely the sort of delivery that it makes when it puts a car on a team track or a siding. It has rendered an additional service which is of additional value to the consignee, which involves additional expense to the railways; which the railway does not and cannot render to shippers generally; and for which, therefore, the railway should make an extra charge. And by the same token when the shipper spots his own cars the railway should not pay him for doing it.

Now, it is well known that in many cases the practice in the past has been for the railway to pay shippers and consignees for rendering to themselves such special services as have been described, or for the railway to render such special services to the shipper or consignee without extra charge. These practices, since their beneficiaries have been only a small part of the shipping public, have constituted unfair discrimination and should be abolished. On the other hand, it seems highly questionable whether it would be just or expedient for the railways to impose, or for the commission to suggest that they should impose, an extra charge for the mere service of placing cars on side tracks.

Should the Interstate Commerce Commission give a definition of delivery similar to that given here, and practically require the railways to cancel all allowances now paid to shippers for services rendered before or after delivery, and to impose a special charge for such services when rendered by the railways, there would be made necessary a radical readjustment which would be painful and expensive to a good many shippers and a good many railways. It would be especially painful and expensive to the weaker roads, which in many cases pay allowances or render special services free because in no other way have they been able to meet the competition of the strong lines.

The fact that the abolition of improper practices will make necessary painful and expensive readjustments is no good reason why such action should not be taken. But certainly the facts and conditions would not warrant the Interstate Commerce Commission in authorizing or requiring the railways to change the practices in question as a substitute for granting a general

advance in freight rates. They would not warrant the commission in doing this, simply because the proposed substitute would not be a substitute at all. It would benefit some railways, but no one could tell how much until the changes actually had been made. All estimates regarding this point are mererly so much waste paper. And the readjustment, instead of causing a net benefit, might actually cause a net injury to the weaker roads. Therefore, for the commission to authorize the railways to increase their net revenues merely by abolishing the unfair discriminations in question would be to give them their additional net earnings in mere stage money.

Three years ago the commission rendered opinions in rate advance cases affecting both the eastern and western roads. In connection with its opinions it made certain forecasts. Subsequent developments have conclusively demonstrated that the commission's decisions in the former rate advance cases were absolutely wrong. Almost everything which the railway managers at that time predicted would occur as a result of the decisions then rendered has occurred. Hardly anything which the commission then anticipated would result has actually resulted. In consequence of the decisions then rendered the situation of the railways has steadily grown worse day by day. At that time Mr. Brandeis was an attorney for the shippers, and he then recommended to the commission that it give the railways stage money in the form of encouragement to increase the efficiency of their operations. The need of the railways for real money is more keen now than it was then; and let us hope that the commission will not again give them nothing but counterfeit coin. If the commission does this once more the result is likely to be some very real developments which will be extremely bad for the country and not adapted to increase public confidence in the commission.

GOVERNMENT RAILROAD MISMANAGEMENT IN CANADA

THE report which a Canadian government commission has just made on the construction by another Canadian government commission of the National Transcontinental railway throws light on the question of government ownership of railways in the United States. The advocates of public ownership base their case largely on the fact that the government can borrow money at a lower rate than private corporations. From this they infer that a saving could be made in the total return paid on the investment. The inference does not necessarily follow from the premise. Whether the total return that would have to be paid on capital would be less under government than under private ownership would depend not only on the rate of interest paid, but also on the amount of capital on which it was paid.

Suppose, for example, that the government could borrow at 3½ per cent., while a private corporation would have to pay 4½. Suppose, also, that a private corporation would build for $35,000 a mile a railway which would cost the government $45,000. In that event the return which would have to be paid on the railway capital per mile of line would be the same. Now, the report of the Canadian commission, which has been investigating the expenditures on the National Transcontinental, tends very forcibly to sustain the contention that government construction is pretty certain, at least in a democratic nation, to be more expensive than private construction. This commission estimates that in the construction work done by the government no less than $40,000,000 has been wasted. As the line is not yet finished, and as the original estimate of its cost was only $61,500,000, the saving made by the use of the government's credit will, if this report is correct, be a mere bagatelle compared with the loss caused by wasteful government management.

While in form somewhat different, in essentials the governments of Canada and of the United States are very similar. Politics over the line is very similar to what it is in this country, except that heretofore it has been regarded as being cleaner there. Consequently, the results of the experiments with government ownership in Canada probably indicate faithfully what the results would be in this country. It is, therefore, desirable that the people of the United States should clearly understand just what has occurred in Canada.

Stated briefly, it was considered desirable that another transcontinental line should be built in Canada. It was decided that the Grand Trunk Railway, under the name of the Grand Trunk Pacific Company, should build the western part of this new system, the government giving its financial and moral support. It was also decided that the government should itself build the eastern part of the new system, which when finished was to be leased to the Grand Trunk Pacific at a rental of 3 per cent. The report of the commission which investigated the government construction as far as it has been carried was abstracted in the *Railway Age Gazette* for February 20, page 394. As already indicated, the original estimate of the cost of the lines to be built by the government was $61,500,000. The investigating committee reports that up to September, 1911, the total cost had reached $109,000,000, and that estimates then made showed that the final cost would be $161,300,000; also reports that if the road is completed at this figure it will in 1922, when, according to the terms of the contract it should be turned over to the Grand Trunk Pacific, have cost the people of Canada in principal and interest a total of $234,651,521, or about $130,000 a mile.

The commission attributes to various causes the waste which it charges has occurred. It mentions the fact that until 1911 the National Transcontinental Railway Commission contained no member who had had railway experience. It asserts that the New Brunswick section of the line, which parallels the government-owned Intercolonial, should never have been built, and implies that it was constructed for the purpose of placating the supporters of the former government east of Quebec. This part of the system alone cost $35,000,000, and the tax-payers of the country are paying $1,200,000 of interest annually on that sum. Numerous other examples of alleged expenditures for political rather than for transportation purposes are cited.

It should be noted that the project for the construction of the road was adopted by an administration controlled by one political party, while the investigation was conducted by a commission created by an administration controlled by another political party. Those not thoroughly familiar with conditions in Canada will have some difficulty in deciding both how much politics there has been in the construction of the National Transcontinental railway, and how much politics there is in the report of the commission which investigated it. But one of three things is certain: Either politics did cause numerous wastes in the construction; or politics has caused a misleading report to be made regarding the construction; or politics has both caused waste in the construction and a misleading report to be made regarding it. In any event, politics and government railroad management have got sadly mixed up. The fact that they have got so mixed in Canada is an indication of what would occur under government ownership in the United States. And even such friends of government ownership as Senator Kenyon, of Iowa, say that unless they were sure politics could be kept out of government management in the United States they would be opposed to government ownership here!

If evidence strongly corroborating the report that politics has got into government construction in Canada be wanted it can easily be found in the results of public management of the Intercolonial Railway, which always has been owned and operated by the Dominion. Annually for many years the Intercolonial has either barely earned its operating expenses, or has just failed to earn them. The fiscal year ended June 30, 1913, was one of those in which it just failed to earn them. Its deficit from operation was $161,000, the ratio of its operating expenses to its gross earnings being 101.3 per cent. The capital stock of the Intercolonial up to June 30, 1912, was $94,746,391. The government must pay interest on this investment whether the road earns it or not. Interest on it at 3½ per cent. is $3,316,000. This, together with the $161,000 deficit, makes a total of about $3,500,000, which in a single year the tax-payers of Canada have to pay out of their pockets for the privilege of owning and operating the

Intercolonial. The reasons why the road fails to earn its interest, or even its operating expenses, are that its rates are too low, and that its management has been inefficient. And the principal explanation of the way its rates have been made, and the way it has been operated, is political influence.

A very wise man once said, "Experience is the best teacher, but the man who cannot be taught by anybody's experience except his own is a d—— fool." This truism applies to nations as well as to individual men. The United States is not now having any experience with government ownership and management of railways. Other countries, which, like ours, have democratic governments, have had and are having such experience. Canada is one of them; France, New Zealand, Australia, Argentina are others. Will this nation be taught by the experience of others, or will it join those nations that have to be taught by expensive experience of their own?

THE PENNSYLVANIA RAILROAD

THERE was a time when the farmers and storekeepers along the lines of the Pennsylvania Railroad preferred to take Pennsylvania pay checks in payment of bills rather than United States greenbacks. Coming down to more recent times, it was the great success of the sale of $40,000,000 Pennsylvania consolidated mortgage bonds that marked the turn of the tide and gave the necessary stimulus to business recovery after the panic of 1907 and the depression of 1908. An analogous commentary on the Pennsylvania railroad as an institution is the fact that to be a Pennsylvania employee is to have a fixed position, the assurance of fair treatment, and a certain respect and prestige in the social and business life of the community. To be a Pennsylvania officer carries with it the distinction of membership in one of the most highly developed organizations in the world.

The Pennsylvania Railroad has, in round numbers, 89,000 stockholders. The executive officers of the Pennsylvania are the trustees of the stockholders, a very large proportion of whom are women. They are the custodians of the Pennsylvania credit and the temporary students of the traditions, organization and ideals which have made the Pennsylvania Railroad a fundamentally important factor in the development of the prosperity of the United States.

The very fact that Pennsylvania executives come up through the ranks of their own organization, gain successive promotions because they are capable of more fully assimilating the accumulated knowledge of Pennsylvania methods and are more fully imbued with Pennsylvania ideals, assures a deep sense of the responsibility of their positions. In a time, therefore, when it might seem that the interests of a few rich railroad companies were not necessarily absolutely identical with the interests of the railroad companies as a whole, the position taken by Samuel Rea in the Pennsylvania Railroad annual report for the calendar year 1913 merits a respectful study by other railroad men, students of political economy, stockholders of the Pennsylvania and those having charge of the regulation of rates, practices and expenses of the railroads of this country. This is all the more true and vital in that no one, not excepting Mr. Rea himself, can say that he knows definitely and accurately just what the company is earning and what are its possibilities of continuance of earnings. It behooves us therefore to look for and give weight to, the more expert opinion available.

Taking the income statement for 1913 without going back of the figures to make any further analysis, the Pennsylvania Railroad earned about 8.3 per cent. on its outstanding stock. Gross earnings from operation were $185,400,000, the greatest in the history of the company; $10,790,000 more than in 1912, which was the best previous year. The gain of nearly $11,000,000 in gross was more than offset by an increase of over $11,000,000 in operating expenses, the increase in expenses being roughly divisible as between maintenance and transportation on a basis of 6 to 5. The net income in 1913 was $41,920,000, out of which it was necessary to take $1,880,000 for appropriations to sinking and other reserve funds; and in 1912 net income amounted to $42,150,000, out of which had to come $1,140,000 for appropriations to sinking funds.

Pennsylvania credit, with its resulting ability to attract capital and so perfect organization and service, rests on a policy which, like any great and successful policy, represents the accumulated knowledge of trained experts. Mr. McCrea, in his testimony before the Interstate Commerce Commission in 1910, attempted to give some concrete expression to a vital part of this policy by saying that for every dollar paid out to stockholders as profit on their investment, there must be a dollar of net earnings put into the property for such purposes as the Interstate Commerce Commission calls additions and betterments. The Pennsylvania is a 6 per cent. stock. It was obvious, therefore, that in 1913 with but a total of 8 per cent. earned the company could not follow this part of Mr. McCrea's definition of its policy.

President Rea says: "It is difficult to escape the conclusion that some way must be found whereby the serious but divided responsibility of governmental regulation of rates, wages, and other railway matters shall either be concentrated under one administrative branch of the government, or the results of legislative acts, orders of commissions, and awards of arbitration boards shall be recognized by rate regulatory commissions, so that regulation of wages, rates and other matters may continue without working a manifest injustice to the railroads, and those who have invested in their securities."

It must be remembered that the Pennsylvania management cannot make such a statement as this for effect. It is dependent on the credit of the Pennsylvania Railroad for every dollar of additional capital that is to be put into the development of the property, and since no property can stand still, and since the desirability of Pennsylvania stock as an investment rests solely on the stability and amount of profit which may be expected from such an investment, it is of the utmost importance that nothing shall be done to either understate or overstate the company's actual condition, needs and prospects. .

The demonstration of the fitness of the Pennsylvania management to speak with the authority of an expert is quite amply contained in the 1913 annual report. The aggregate expenditures for construction and equipment during the year was $41,434,000; in 1912 it was $16,322,000; and in 1911, $14,320,000. There are under way certain large pieces of betterment work, the most important of which, actually undertaken, is the additional trackage and terminal facilities at Philadelphia, described in detail in various previous issues of the *Railway Age Gazette;* and the most important, shortly to be undertaken, is the electrification of the main line from Altoona, Pa., to Conemaugh, which is where the Pennsylvania crosses the Alleghany mountains.

The Pennsylvania plant, however, even as it is today, is more than adequate to handle the peak of the load of such a business as it did in 1913, and much more than adequate to handle the business that has come to it during the past four months. There are two very large yards which, with their connecting lines, form additional outlets for main line business, that were in use for a part of the time in 1913, but are now not necessary to handle the very much smaller volume of business. These are the Hollidaysburg yard, which, with its connecting lines, forms an alternative route over the mountain, and the Marysville yard. There was no congestion on the Pennsylvania in 1913 with the exception of the line to Buffalo, where weather conditions at times make congestion almost inevitable. An extensive program of improvements, however, is under way for the betterment of this line.

The five grand divisions which form the Pennsylvania Railroad carried 166,150,000 tons of freight, an increase of 9,800,000 over 1912; and since the average length of haul was only very slightly less in 1913 than in 1912, the ton mileage handled increased proportionately. The freight density (ton miles per mile of road) was 5,760,000 in 1913, an increase over the previous year of 290,000. The total number of passengers car-

ried in 1913 was 77,970,000, an increase of 5,520,000; the average distance each passenger was carried remaining almost exactly the same as the year before, namely, 25.4 miles. The passenger density was 489,000, an increase of 32,000 over the previous year. With the increase of 5.81 per cent. in ton mileage handled, there was an increase of but 0.88 per cent. in freight train mileage; and with an increase of 7.50 per cent. in passenger mileage, there was an increase of but 3.86 per cent. in passenger train mileage.

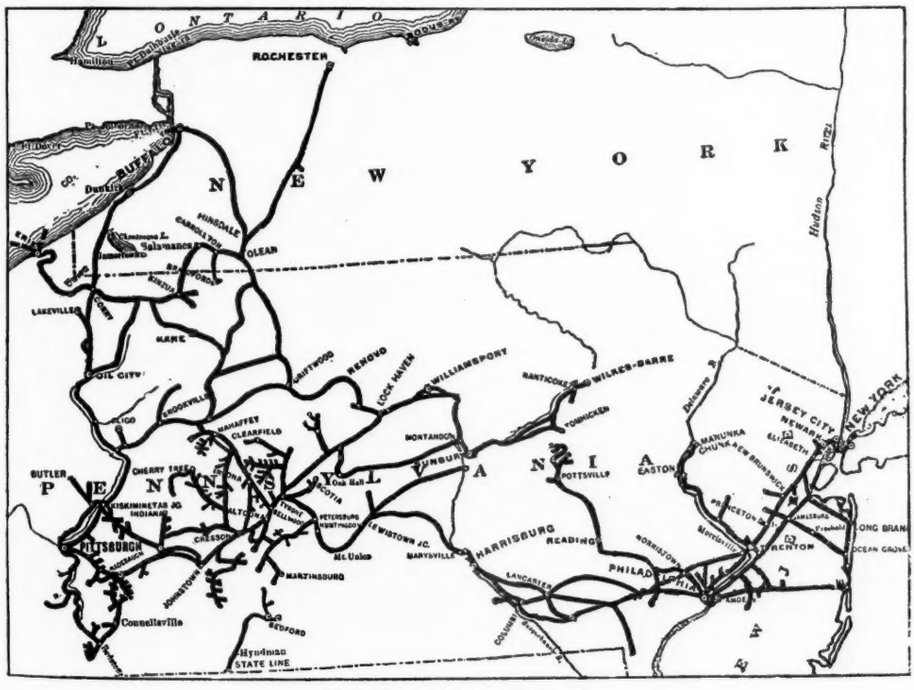
The average train load of revenue freight in 1913 was 719 tons, an increase of 34 tons over 1912, or about 4.7 per cent. Despite this increase in train loading, expenses per ton per mile (the Pennsylvania divides its expenses as between freight and passengers) were 4.28 mills per ton per mile in 1913, as against 4.36 mills in 1912. In other words, the increase of 4.7 per cent. in train loading was not sufficient to offset an increase of 8.7 per cent. in freight train expenses per train mile.

The results in passenger service, however, were an exception to the rule that has been almost unbroken on the great majority of railroads in this country in the last five or six years, that an increase in passenger business could not be handled without a proportionate increase in passenger train expenses. The average expenses per passenger per mile in 1913 were 1.803 cents, as against 1.829 cents in 1912. While there was an increase of over 3 per cent. in passenger train mileage, there was an increase of 3 per cent. in the average number of passengers per train, and an increase of but 1 per cent. in passenger train expenses per train mile. While, of course, there are not detailed figures enough in the annual report to show exactly how the economies in passenger service were effected, it is quite possible that the Pennsylvania is beginning to realize that competition in passenger service is by no means always profitable. The Pennsylvania has not shown any disposition, nor would public opinion probably tolerate such a disposition, to reduce passenger service at the expense of the convenience of the public. On the other hand, where two or more railroads run between two important cities, it has been common practice for the passenger traffic department to insist that every new fast train of a competitor must be met by a new fast train. In other words, quite often, instead of attempting to develop new business by a certain train schedule, the schedule is so arranged as to try to prevent the other fellow from getting more than his share of the business; and operating men for a number of years have pretty generally maintained that this kind of business was unprofitable. If the Pennsylvania is succeeding in effecting economies along these lines, it will be one more of the great number of cases in which the Pennsylvania has shown that its reputation for conservatism is an aid rather than a drawback to its taking the lead in well thought out reforms.

The increased maintenance expenses are due in part to more material having been used in roadway and track, in part to the greater wear and tear on track and on equipment, due to the greater mileage made, heavier train loading, etc.; and also in the maintenance of equipment expenses, to certain other causes, probably, which are not indicated by the annual report.

Pennsylvania maintenance of way expenses appear very liberal on any basis of comparison with other roads. Pennsylvania standards are very high; 100-lb. rail, tie plates and stone ballast suggest the standards; and while the replacement of wooden or steel structures by concrete structures may in time reduce the cost of maintenance, the continued increase in weight of equipment is, even with Pennsylvania standards, putting a severe burden on maintenance expenses, and despite the expenditure of $3,014,000 more in 1913, the total being $24,117,000, than in 1912, there is probably even yet delayed maintenance work to be done on the Pennsylvania.

Maintenance of equipment cost $38,850,000 in 1913, or $2,765,000 more than in 1912. Somewhat smaller amounts were charged for depreciation in 1913 than in 1912, the amount on locomotives being $2,110,000, or $436,000 less than in 1912; on passenger train cars, $736,000, or $926,000 less than in 1912; but on freight cars, $2,769,000, or $634,000 more than in 1912. Repairs, renewals and depreciation of locomotives per mile run cost 14.58 cents in 1913 as against 14.77 cents in 1912; the decrease, however, being due nearly entirely to decreases on the Eastern Pennsylvania division and to a less extent on the Western Pennsylvania division, with quite large increases on the Northern division and some increases on the Erie division.



The Pennsylvania Railroad

The Pennsylvania Railroad in 1913 sold to its stockholders at par $45,000,000 stock and paid off its $9,000,000 equipment trust loan, falling due in September, 1914, issuing $7,670,000 equipment trust certificates. Cash on hand at the end of the year amounted to $30,268,000, or almost exactly the same as at the end of the previous year, and total working assets amounted to $80,600,000, while working liabilities amounted to $30,410,000.

A very important step was taken during the past year in the readjustment of the relations between the Pennsylvania and its interests in anthracite coal lands and mining companies. These coal properties were merged during the year into the Susquehanna Coal Company and under this arrangement the Susquehanna Coal Company is to issue its 5 per cent. 5-year bonds, exchangeable for its first mortgage bonds, to the Pennsylvania and the Northern Central. The Pennsylvania has apparently, therefore, now placed itself in such a position that it can divest itself of all interest in the coal company and still insure the continued operation of the unprofitable as well as profitable coal mines and conserve the coal supply tributary to its lines.

The following table shows the principal figures for operation

of the Pennsylvania Railroad in the year 1913 as compared to the year 1912:

	1913.	1912.
Average mileage operated	4,044	4,025
Freight revenue	$134,794,341	$127,578,202
Passenger revenue	37,964,808	35,405,555
Total operating revenue	185,400,825	174,607,598
Maint. of way and structures	24,116,756	21,102,640
Maint. of equipment	38,853,179	36,088,367
Traffic expenses	2,614,011	2,312,400
Transportation expenses	67,943,268	62,895,553
General expenses	4,460,186	4,238,984
Total operating expenses	137,987,401	126,637,945
Taxes	7,326,660	7,128,535
Operating income	38,182,483	39,693,133
Gross income	57,712,899	58,982,867
Net income	41,920,833	42,153,964
Appropriations for sinking funds	1,882,775	1,138,628
Dividends	27,198,918	28,394,248
Surplus	11,839,140	12,621,088

NEW BOOKS

Working Drawings of Machinery. By Walter H. James and Malcolm C. McKenzie. Bound in cloth. Illustrated. 6 in. x 9 in. 140 pages. Published by John Wiley & Sons, 432 Fourth avenue, New York. Price $2.

While this book is planned especially to meet the needs of the second and third year students who are studying drawing in the department of mechanical engineering at the Massachusetts Institute of Technology, it is not by any means a text book, but rather takes the form of a treatise in the application of mechanical drawing to the describing or designing of machinery. It gives a correct conception of the character and purpose of a working drawing, exact relation between the pictorial drawing of an object and its orthographic projection, and illustrates good modern practice in methods of representation, dimensions, drafting room systems and the like. Further it explains briefly, from the standpoint of the engineer rather than from the architect's, a few of the common methods of pictorial representation, particularly of mechanical perspective. The text is clearly expressed and the illustrations are on a scale well suited to the size of the page.

Analyses of Coals in the United States. By N. W. Lord. Bulletin No. 22, Department of the Interior, Bureau of Mines. In two parts. Bound in paper. 6 in. x 9 in. 1,200 pages. Illustrated. Published by the Bureau of Mines. Copies free.

This bulletin contains, in the first part, analyses which have been made by the United States Geological Survey and the National Bureau of Mines from 1904 to 1910 of over 10,000 samples of coal collected in the United States. In the second volume are full descriptions of the samples that are shown by analyses only in the first part. These descriptions have been compiled from the note books of the persons who collected the samples and present such information regarding the character of the coal, the impurities in the beds sampled and the nature of the roof and the floor of the bed, as has a definite bearing on the significance of the analysis of the samples. They also give supplementary details as to the capacity or output of the mine, the methods used in mining, the preparation of the coal and its chief uses. The bulletin contains chapters by J. A. Holmes, F. M. Stanton, A. B. Fieldner and Samuel Sanford.

Scientific Management. Addresses and discussions presented at the First Tuck School Conference, Dartmouth College. Bound in cloth. 6 in. x 9 in. 387 pages. Published by the Weekly Bulletin Publishing Co., Boston, Mass. Price $2.50 net.

This book contains a complete report of the conference on Scientific Management held at Dartmouth College under the auspices of the Amos Tuck School of Administration and Finance, including papers on the principles of scientific management, scientific management and the laborer, scientific management and the manager, discussions of the applicability of scientific management in certain industries, scientific management and government, and other phases of scientific management. Among the authors are included Henry B. Quinby, ex-Governor of New Hampshire; Ernest Fox Nichols, LL.D., president of Dartmouth College; Frederick W. Taylor, consulting engineer; Henry L. Gantt, consulting engineer; Harrington Emerson, consulting engineer, and others who are noteworthy in scientific management.

Letters to the Editor

WILLIAM H. BOARDMAN

New York, February 25, 1914.

To the Editor of the Railway Age Gazette:

May I be permitted briefly to endorse what has been so well said by Col. Prout and Mr. Morris on Mr. Boardman's exceptional combination of sweetness and strength of character, sympathy with the upward struggle of the young man, enthusiastic love of nature, keenness of humor and fearless integrity.

His forceful influence as an editor was for the upbuilding of a high sense of honor in the railroad profession, and his loss will be deeply felt by those who appreciated him for his work as well as for his lovable human qualities as a friend and man.

W. J. Wilgus.

PROPER SUPER-ELEVATION ON CURVES

St. Louis, Mo., February 16, 1914.

To the Editor of the Railway Age Gazette:

On pages 212 and 213 of your issue of January 30, the editorial on "Track Conditions and Speed" quotes the Interstate Commerce Commission's investigation as attributing the accident on the Mobile and Ohio, near Buckatunna, Miss., on October 19, to "operation at this high speed (not less than 55 miles per hour) while rounding a curve of 3 deg., with only 3½ in. super-elevation."

It is true that the proper elevation for a 3 deg. curve, where *all* trains operate at 55 miles per hour, would be 6 in., but I believe it is generally considered within the limits of safety to place a maximum of not to exceed two-thirds of the trainload on one rail. On this basis a 3 deg. curve in perfect alinement, with a perfectly uniform elevation of 3½ in., and with proper spirals, would be safe up to a maximum speed of 75 miles per hour.

Tender derailments are frequently, and possibly in this case, due to a combination of defects in the track and equipment, such as irregular elevation or line, improper location and clearance of side bearings, improper coupling between engine and tender, etc. Such derailments are by no means limited to curved track, but occur frequently on straight track, and also frequently at comparatively low speeds. In a loaded refrigerator car with meat hooks for carrying the load at the carlines, the center of gravity would be higher than the center of gravity of a loaded tender.

This letter is not intended as a discussion on tender derailments, but is merely to call attention to the fact that, under the conditions stated, "insufficient super-elevation" could hardly be attributed as the primary cause of the derailment.

V. K. Hendricks,
Assistant Chief Engineer, St. Louis & San Francisco.

[The adjustment of the elevation on curves on single track lines for high speed passenger trains and slow tonnage freight trains always presents a puzzling problem. As Mr. Hendricks states, a speed of 55 miles per hour is not unsafe with perfect track and equipment. However, this latter condition seldom exists on the average road, and the factor of safety may therefore become too low.—Editor.]

New Railway Terminal in China.—Bids have already been submitted to the colonial government of Hongkong for the construction of the buildings to be used in connection with the railway terminal of the British section of the Kowloon-Canton Railway. The construction of the surrounding system of terminals and yards is already well under way. Hongkong business men expect that with the development of railway enterprises in China, this Kowloon terminus will be one of the most important in the far east.

The Track Elevation Subways in Chicago

Development from the Shallow Floor Steel Structures Built in 1892 to Those of Reinforced Concrete

By W. S. Lacher
Office Engineer, Chicago, Milwaukee & St. Paul, Chicago

The elevation of railroad tracks for the elimination of street grade crossings in the city of Chicago, completed, under construction or covered by ordinance, involves 140 miles of roadbed, provides for over 800 miles of tracks, and has required the individual and combined efforts of 20 railroads over a period of 20 years. Nowhere else in the world is there a situation to be compared to this in magnitude, complexity of the railroad layout, or diversity of method of execution. Consequently Chicago has been the greatest field for the development of methods of construction, and suitable types of structures. This has been particularly true of the street, alley and railroad subways, of which now close to a thousand have been built.

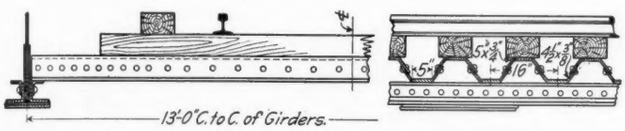


Fig. 1—Early Trough Floor Built by Illinois Central in 1892

As tracks are elevated solely to obtain the required difference in grade to permit the streets to pass through the subways underneath, the latter are the controlling features of any track elevation project. The vertical headroom, depth of floor and street depression fix the height of the embankment. Circumstances involved in the construction of the substructure generally determine the conditions under which the project must be executed. For these reasons every effort has been made to develop types of subways that would most satisfactorily fulfill the conditions imposed. Fortunately the drafters of the original track elevation ordinance placed the problem clearly in the hands of the railway engineers and limited themselves to statements of the results to be attained—permanent construction, subways of certain clear width and height, and protection against water and other drippings.

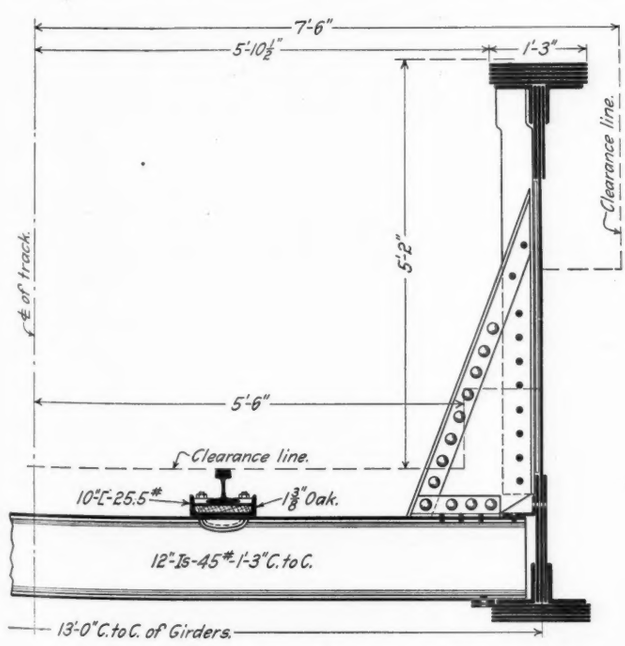


Fig. 2—Shallow I-Beam Floor Built by C., M. & St. P. in 1900

The pioneer engineers in this work turned naturally to the through plate girder bridge supported on masonry abutments and one or more bents of iron or steel columns. The majority of the subways built up to the present time are of this type and development as to the girders and columns follows closely the general advance in structural steel practice for the period covered. In some of the early designs the continuous girder was used, but it proved unsatisfactory and the practice was soon abandoned. In the substructures the ordinary practice was followed, accompanied by the universal change from stone masonry to concrete. Practically all the recent abutments have been of mass concrete, with but few developments in reinforced concrete.

The track floor has been the most important feature of the subway, not only because of the condition of water tightness imposed by the city authorities, but also because the distance from base of rail to "low iron" represents a direct addition to the required height of the embankment. More studies of floor design have therefore been made than for any other part of the structure, with the result that the designs are decidedly varied. The study of the subway, then, must be really a study of the floor.

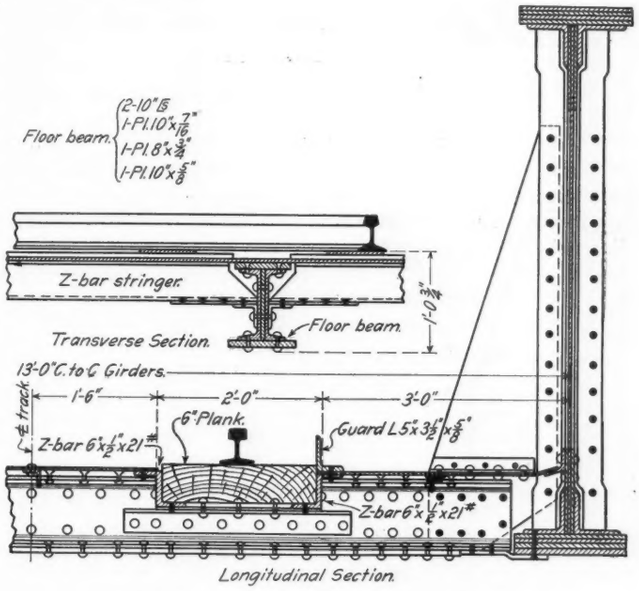


Fig. 3—Shallow Floor Built by C. & N. W.

In completing the Hyde Park track elevation in 1892, in time to eliminate grade crossings at the entrances of the Columbian Exposition, the engineers of the Illinois Central were the pioneers. Their conclusion that a floor of minimum thickness was paramount, obviously had a marked influence on the work of engineers on succeeding projects, for the shallow floor idea prevailed for a number of years. Although the ballast floor was actually taken into consideration on this first project, it seems strange that it was not put into practice by any road until about ten years later.

The floor adopted is that shown in Fig. 1. It had been pre-

viously used in England under the name of the "Lindsay Floor," but one of the mills in this country at that time had rolls for the required trough sections, thus making it available for this work. It was originally intended to place the ties in the bottom of the troughs, but at the time of construction, they were placed on top of the ribs between troughs, as shown and have been maintained in that position ever since. While this floor is obviously light according to present standards, its extreme flexibility under load causes a wide longitudinal distribution of the wheel concentrations. The structures are in use today without apparent distress and have not been altered, except in the case

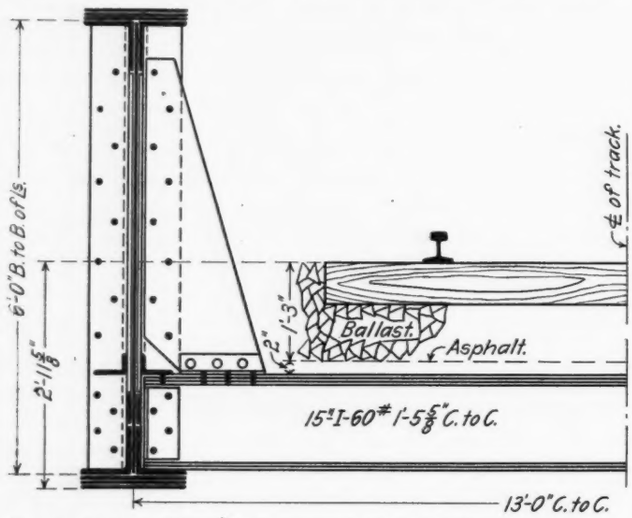


Fig. 4—Early C. N. & W. Structure with Asphalt Mastic Protection

of two through tracks, where deck beams have been added on either side of the rail, to produce a more effective wheel load distribution to the several troughs. Drainage is provided by a sheet metal trough under the floor adjacent to each girder.

A number of years elapsed before any further track elevation work was done. In 1895 work was started on the lines of the Rock Island and the Lake Shore & Michigan Southern, between

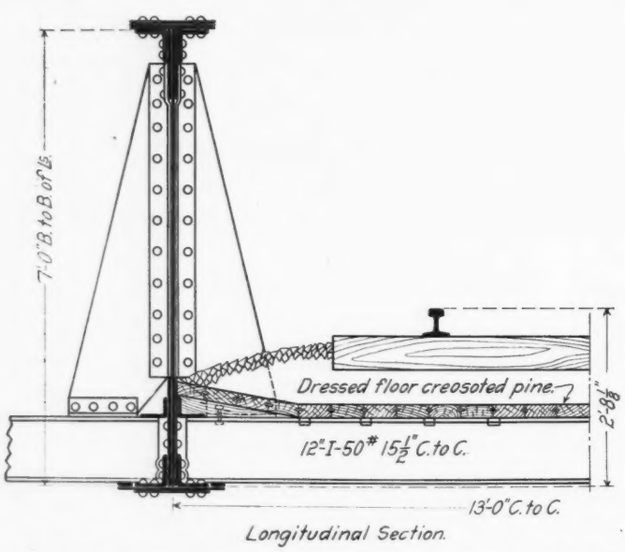


Fig. 5—Beam Floor with Creosoted Plank Floor Built by C. & A. in 1901

the St. Charles Air Line at Sixteenth street and Sixty-third street. Here the idea of the shallow floor was followed, but with a different form of construction. The floor consisted of 10 in. 33 lb. I-beams, placed transversely, 10.85 in. center to center, the ends being suspended from an inclined plate riveted to the webs of the girders. The beams were covered by a 5/16 in. cover plate to make a solid floor from girder to girder. The rails were bolted directly to the iron floor with clip washers designed to conform to the rail base. In later work the beams

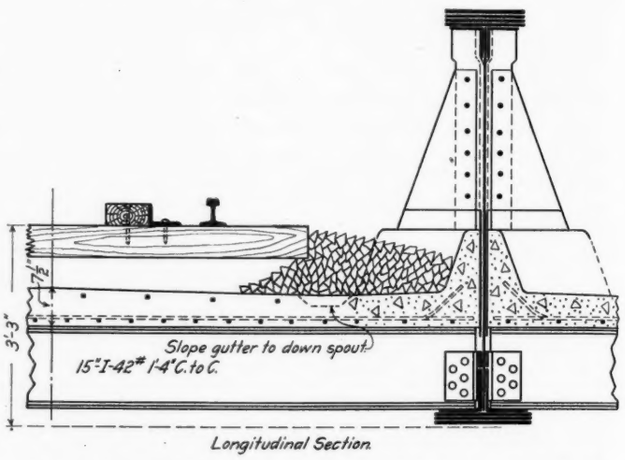


Fig. 6—Concrete Deck on I-Beam Floor Built by C., M. & St. P. in 1905

were changed to 12 in. depth. This type of floor was at once adopted by many of the other railroads and is now in use in the original form or as modified later to obtain a ballast floor on 55 per cent. of all the subways built. Fig. 2 gives another example of this type of floor, which was used on the C. M. & St. P. in 1900, but which differs from the original design in that the beams are 12 in. 45 lb. I-beams, 1 ft. 3 in. center to center and the rail is set on a creosoted plank, placed in a 12 in. channel.

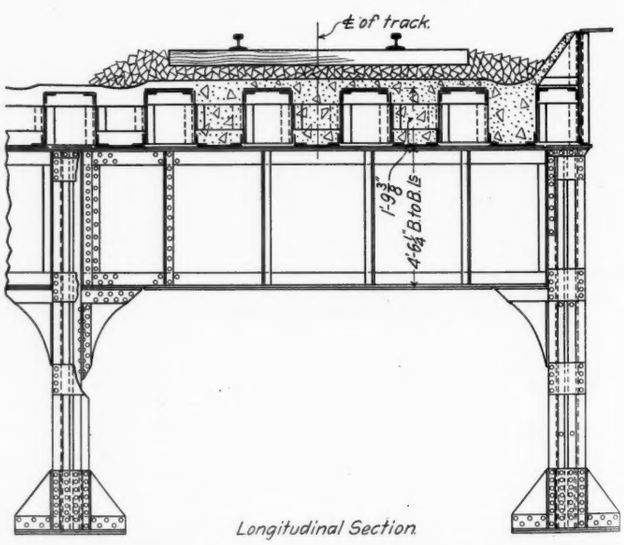


Fig. 7—Ballasted Trough Floor Built by C. & N. W. in 1909

The beams are supported directly on horizontal legs of the bottom flange angles, a practice which was very common at that time.

Within a few months after the first I-beam floor was built, the C. & N. W. put into effect a very ingenious design for an extremely thin floor. This is shown in Fig. 3. It is really of the floor beam and stringer type. The rail rests directly on a stringer consisting of a timber supported by two 6 in. x ½ in. 21 lb. Z-bears. The floor beams, which are spaced 4 ft. 9 in. between centers, consist of two 10 in. 22¾ lb. channels, and one 10 in. x 7/16 in. web plate with cover plates top and bottom.

Plates 5/16 in. thick, riveted to the floor beams, stringers and girders, filled the open spaces to make a solid floor. The floor beams are secured to the girders by gusset plates riveted to the outstanding legs of stiffener angles. By dropping the floor beams down so that the rivet heads in the bottom cover plates are even with the rivet heads in the bottom flange of the girder, a floor thickness from low iron to base of rail is obtained which is to only 1 ft. 0¾ in.—about as small as has ever been attempted. This floor was designed for an axle load of 40,000 lb., with unit stress in bending of 9,000 lb. per sq. in. It is carrying an actual load close to 50 per cent. higher than this in a large number of subways without sign of distress. In some of the later subways, the stringers were modified by adding a bottom plate so that with the two Z-bars, a built up channel was formed to carry the timber rail seat. This scheme proved more waterproof than the one having the timber exposed on the underside.

A large majority of all the track elevation subways built up to the year 1901 were of the types described above, principally the I-beam and the C. & N. W. type. In each of these, security against leakage into the subway space beneath as well as against corrosion of the steelwork, depends upon waterproofing the floor plate with some material. Owing to the nature of the construction and the slight grade available for drainage, this proved troublesome and expensive of maintenance. The subways were noisy and the repeated transitions from special bridge floors to standard ballasted track proved a burden for the track forces. As a result of these experiences, the engineers on the later projects made studies of ballast floors and various schemes were soon tried.

Naturally one of the first schemes to be called to mind was to put an asphalt sand mastic on the floor plates of an I-beam floor to serve as waterproofing and also to give the required slope for drainage. The ballast was then applied directly on this asphalt surface. An example of this is given in Fig. 4, which was used by the C. & N. W. in 1902. The I-beams span transversely between girders in the roadway span, but span longitudinally across the sidewalk span from the abutment to a cross girder at the curb bent.

Fig. 5 shows a scheme used by the C. & A. R. R. in 1901. The I-beams are covered with creosoted plank, with a few next to each girder turned up in the form of a curb. The ballast was then placed in the trough-like space thus formed.

With the rapid development of the use of reinforced concrete, it was but natural that a concrete floor superimposed, or imbedded about the I-beams should be utilized as a deck to receive the ballast. An example of this type, which was used by the C. M. & St. P. in 1905, is given in Fig. 6, 15 in. 42 lb. I-beams spaced 16 in. center to center are covered by a slab of concrete 7½ in. thick at the center line of track, diminishing to a gutter just outside the gusset plates, with a curb against the girder web and around the gussets. The concrete deck had such pronounced advantages over the other two schemes that it rapidly superseded them. The principal advantage is that the top surface can be readily given the required gradient for thorough drainage and thus obtain the first requisite of waterproofing—to get the water off the bridge. Also in case of faulty waterproofing material, it is not harmed and if well constructed, will, in a large measure, make up for poor condition of the former.

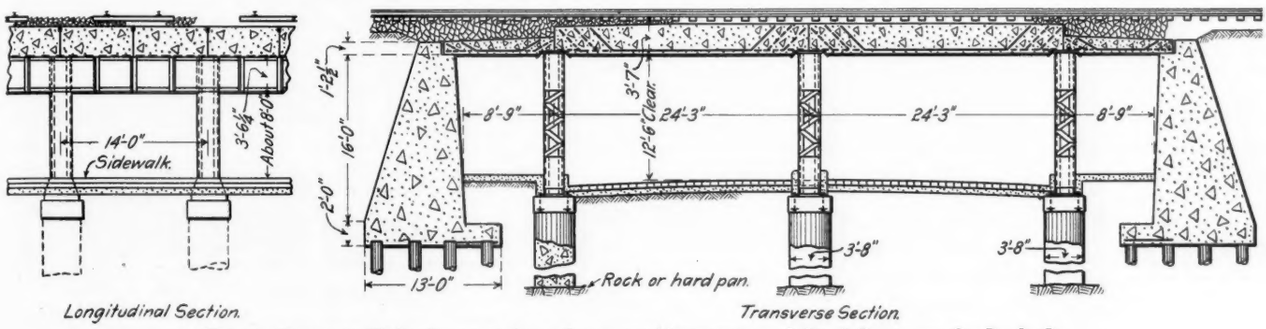


Fig. 8—Concrete Slabs Supported on Concrete Abutments and Steel Bents on C., B. & Q.

Another type of floor which was used quite extensively is what is known as the trough floor. It resembles the Illinois Central floor in principle, but is made entirely of plates and angles, has vertical sides and is generally from 14 in. to 18 in. deep and of equal width. This floor was first used the same as the I-beam floor, spanning transversely between girders. The ties were originally set on top of the horizontal top plates of the troughs. A modification of this was used by the P. C. C. & St. L. in 1904, in which the bottom of the troughs consisted of creosoted planks and the length of trough was increased to permit two tracks between each pair of girders. The trough floor was very readily adapted to the demand for ballast floors. The troughs were filled with concrete or asphalt mastic (the former proving more successful), to about 2 in. over the top; the whole was given a smooth finish and pitched to obtain drainage.

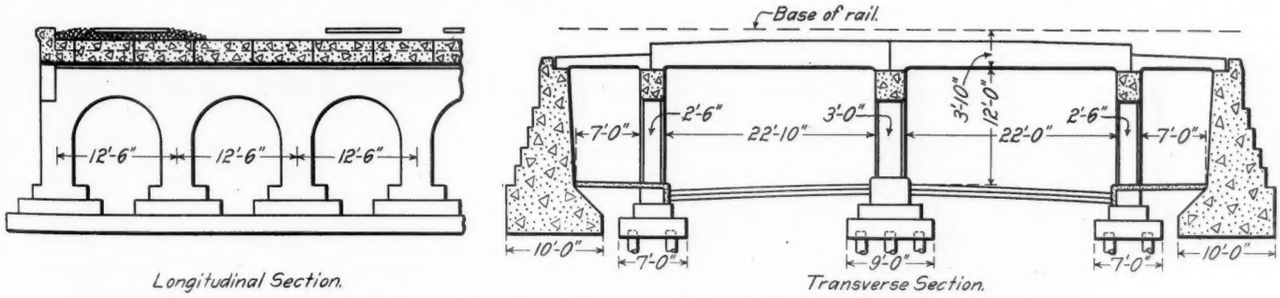


Fig. 9—Concrete Slabs on Concrete Abutments and Bents Built by Illinois Central in 1907

During the first ten years of track elevation work, long spans with a minimum number of intermediate supports predominated. Over 200 subways were built with clear spans between abutments. In the absence of any objections, the city authorities naturally expected designs of this character and the railroads made little effort to secure shorter spans. The girders, therefore, project materially above the track level. At the same time

the necessity for the maximum development of valuable right-of-way precluded a wider spacing of tracks than the standard 13 ft. 0 in. The result was as illustrated in Fig. 2, an entire disregard of the established bridge clearance diagram. This condition was common to all roads involved.

In consequence of the use of the deeper ballast floors, the vertical distance between the top of rail and top of girders was materially reduced. Observation of this fact naturally gave birth to the idea that a decrease in the depth of girders (possible with short spans) would accomplish a further reduction of this distance sufficient to bring the top of the girder outside the standard bridge clearance. Perceiving the inconsistency of vast expenditures for increased safety of street traffic, which directly involved construction resulting in a greater hazard to railroad employees, the city authorities, in later ordinances, were led to authorize the use of short spans in practically all subways. The standard street subway in Chicago today is therefore a four span bridge with bents at the curbs and the center line of streets, which has made it possible to keep all girders outside of standard clearances in all except unusual cases. It also permits the use of other forms of construction which eliminate girders entirely and give an uninterrupted ballast surface from parapet to parapet. Fig. 7 shows an example of this type. It is the ballasted trough floor spanning longitudinally from bent to bent. A facia girder on each side serves as a parapet to retain the ballast and gives the appearance from the street of a plate girder bridge. In some cases this facia girder is made of concrete, greatly improving the appearance of the subway. As the reaction of the longitudinal trough floor is distributed uniformly over the entire width of the bents, a heavy cross girder is required between each pair of posts, giving the bent a much more substantial, dignified appearance than that to be obtained in a bent having posts connected by open latticed bracing.

Almost simultaneously with the beginning of the reinforced concrete slab trestle on railroads, reinforced concrete slabs were introduced for the superstructure of subways. This was done by the C. B. & Q. in 1906. As illustrated in Fig. 8, the design consists of concrete slab spans supported on abutments and steel bents. The slabs for the roadway spans are 24 ft. 3 in. long, 7 ft. 0 in. wide, and 2 ft. 9 in. thick; those for the sidewalk span are about 12 ft. 0 in. long, 7 ft. 0 in. wide and 1 ft. 4 in. thick. The bents are composed of steel columns spaced

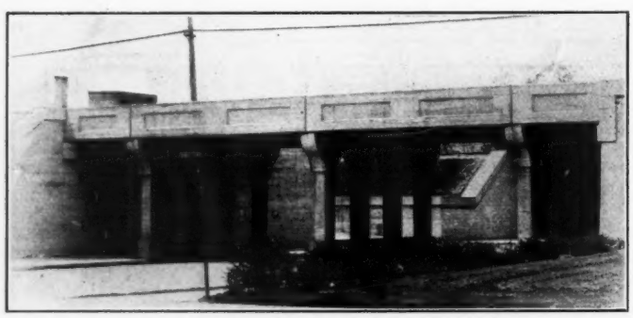


Fig. 10—C. M. & St. P. Subway at Madison St., Evanston, Ill.

14 ft. 0 in. on centers connected by steed box girders with wide top cover plates for the bearings of the slabs.

In 1907 the C. B. & Q. eliminated structural steel from the subways entirely by substituting a reinforced concrete bent for the steel bent described above. The Illinois Central designed similar subways the same year for what is known as the Grand Crossing track elevation. This is indicated in Fig. 9, which shows a longitudinal section and an elevation of one of the concrete bents. The latter is essentially a concrete wall 2 ft. 6 in. or 3 ft. 0 in. thick, pierced by arched openings of 12 ft. 6 in. span. The slabs are 6 ft. 3 in. wide.

In figure 10 is shown a cut of one of the reinforced concrete subways of the C. M. & St. P. track elevation in Evanston, Ill., commencing just north of the Chicago city limits. In this case the bents at the curb and in the roadway are clearly posts surmounted by arches. The design admirably fulfills the requirements of esthetics, stress and utility; the greatest cross section is obtained in the arched girders, while the section of the columns is reduced, providing better lighting of the subway and giving the required slenderness of appearance. The slabs are 13 ft. wide, one for each track, thus giving a concentric loading and permitting a distribution of the live load over the full 13 ft. 0 in. feet of width.

A further modification in the concrete subway is that of the C. B. & Q. subway at Clyde, Ill., built in 1911, and shown in the

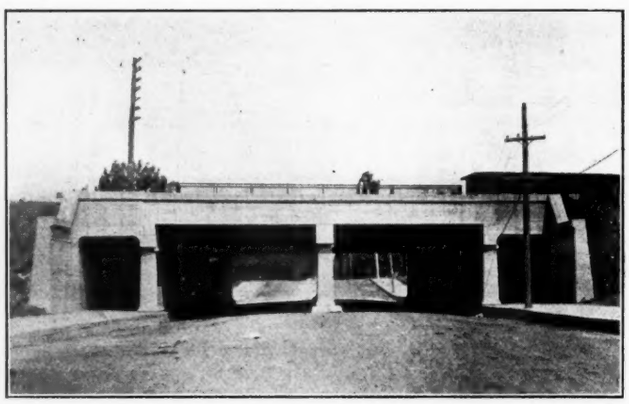


Fig. 11—Box Abutment Subway at Clyde, Ill.

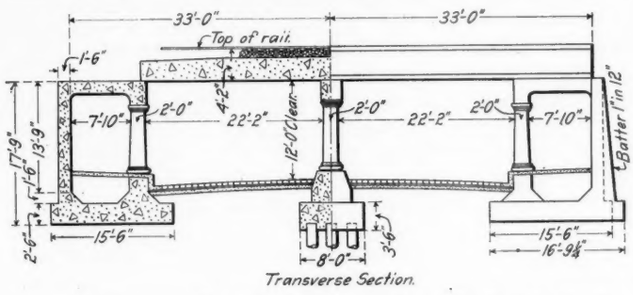
cut in Fig. 11, and in Fig. 12. In this a pronounced departure is made from the usual mass or gravity abutment. From the figure it is seen that the footing under the property line wall and the footing under the curb line bent are built continuous and that this footing, together with the property line wall, the curb line bent, and the sidewalk span slab, are combined to make a rigid enclosed rectangle forming what might be called a box abutment. By this means the lateral earth pressure is taken care of with much less material than with the ordinary mass abutment. The only change in the outward appearance is to decrease the headroom of the sidewalk spans by 1 ft. 6 in., a matter of minor consideration.

The problem of waterproofing subways was of course of prime importance from the very start, though the floors of the earlier structures embodied certain features, such as lack of sufficient gradient, which precluded the success of the best possible waterproofing material, or methods. In consequence, many of the subways have been subsequently equipped with sheet metal aprons suspended just under the decks to protect the street traffic from drippings. In other cases only extreme vigilance on the part of those responsible has maintained the subways reasonably watertight. With the introduction of the concrete ballast deck, most of the difficulties were overcome and the problem was reduced to the production of a continuous watertight surface. It may be safely said that the present stage of the art is largely the result of the studies and experiments made in the course of this work. At present the waterproofing generally consists of a membrance made up of successive layers of asphalt or some proprietary bitumen compound, mopped down between sheets of burlap, felt or paper, the whole covered by a protection consisting of a thin reinforced concrete shell, an asphalt mastic, or a layer of brick. Another feature of waterproofing which has been very carefully developed is the matter of drainage. It has been found that it is not enough to carry the water to the back of the abutment. All properly completed plans for subways now provide for a complete system of drainage to carry all water from behind the abutments into the sewers, and in the case of steel subways, generally

provide for downspouts at two or more of the intermediate bents.

A study of the types of structures prevailing in the more recent track elevation projects is especially important as an index of the trend of future development. This can be done most readily by ascertaining what forms of subway have been used on the latest track elevation projects and also what types have become more or less the standard practice of the several roads. It is of course necessary to leave out of consideration here, subways which are of special construction, on account of peculiar conditions arising in the given case, and which would not apply in the usual layout.

The reinforced concrete subway is being used extensively by the I. C., the C. B. & Q., and the C. M. & St. P. The last mentioned is using reinforced concrete exclusively at the present time on what is known as the Bloomingdale Road track elevation. The C. & A. is also building three subways of this type. Reinforced concrete has a number of advantages over the steel structure. It is obviously the most permanent form of construction, it produces a practically noiseless subway and lends itself at small expense to very handsome designs. This last feature has proven quite important in connection with the requirements of the several park boards for subways which cross boulevards. In the case of steel structures, very commendable efforts have been made for architectural enhancement, which in the latest designs has generally involved the use



Transverse Section.

Fig. 12—Concrete Box Abutment over Sidewalk, Built by C., B. & Q. in 1911

of concrete in the form of a facade at the portal of the structure. While some of these have been very successful as to design and workmanship, they are marred by the fact that they are too clearly ornamental screens, which do not form an integral part of the structure. However, while reinforced concrete is used almost exclusively by a few railroads, it has not been used at all by others, and it is therefore not safe to make any predictions as to the extent of its future use.

The longitudinal trough type is now the most common of all steel structures; it is the standard subway of the C. & N. W., which has used it extensively, especially on the Evanston track elevation and the approaches to the new passenger terminal. In the Grand Crossing track elevation, one of the more recent projects, involving the combined efforts of several different roads, we find reinforced concrete subways and also steel subways, with both the longitudinal trough floor and the I-beam floor spanning transversely between girders. On the recent South Chicago track elevation, the longitudinal troughs predominate.

The types enumerated above are clearly the prevailing types at the present time. In addition thereto, we find the trough floor used transversely between girders and the longitudinal I-beam span. All of these structures involve the use of ballast on a decking of reinforced concrete. There are of course exceptional cases where an especially thin floor is imperative, but they are the exception.

STEEL TIES IN INDIA.—The shortage of wood and the resulting high price of wooden ties has made it necessary for the Secretary of State in India to invite tenders in England for a supply of steel ties.

A SHIPPER'S VIEW OF CAR POOLING*

BY J. S. MARVIN

General Traffic Manager, National Automobile Chamber of Commerce

There has been a growing feeling among shipping interests of late that carriers could well make a change in the rules governing the interchange of cars; that common box cars in particular should be treated as a unit and the most convenient car used regardless of ownership or the direction of the shipment. Every movement of cars means some expense and delay. A factory could unload a string of cars containing incoming freight and, although having an equal amount of outgoing freight, the same cars could not be utilized because the initial carriers would not permit them to travel to the destinations necessary. A western line car could not be used for an eastbound shipment and an eastern line car, perhaps, could not be used for a southern shipment, etc. The string of empties would have to be pulled out and other cars placed for loading. On the other hand, while these rules might be enforced at one point and by one road, another railroad through its absolute helplessness insofar as ownership of equipment is concerned would be forced to permit the shippers on its rails to load cars almost entirely without reference to car service rules. These conditions have existed to a greater or less extent according to the general car supply at various times.

Car Service Rule No. 1 of the American Railway Association requires that freight cars be promptly returned to their owners. Rules 2, 3 and 4 state how cars are to be returned to their owners as to route and other details which in brief is, that cars may be loaded only to and in the direction of home, or they may be sent home empty over the route taken on the outward journey.

The act to regulate commerce provides that it shall be the duty of every carrier to establish through routes and to provide reasonable facilities for operating such routes and to make reasonable regulations with respect to the interchange of cars so that through routes may be kept open. The Interstate Commerce Commission has stated that our railroads are called upon to so unite themselves that they will constitute one national system. Nobody at this time would suggest that a railroad restrict the use of its cars to traffic confined to its own line. The requirements of commerce and the law make this impossible. A general interchange of cars among carriers is necessary, and the question arises, is the rule that cars when away from home must be loaded home or in the direction of home, or sent home empty via certain routes, as reasonable and flexible an arrangement as the carriers can be expected to make under their obligation to provide prompt facilities of commerce? And when a shipper is denied the use of a car standing empty on his siding on account of these rules and compelled to await the arrival of a car of different ownership, even though the delay endangers his business, is not the rule which forces these conditions an "unreasonable regulation and practice with reference to commerce," which the act declares unlawful? But aside from that, is there not in such practice a tendency towards congestion and an economic waste which is far greater than the advantage sought by sending cars home? For it is a fact that during heavy business the proportion of cars on home roads is much less than during periods of business depression. This would indicate that the present rule is not effective at the time when it would best serve those who favor its continuance on the theory that they are entitled to the use of their own cars.

In a case (22 I. C. C., 39) where a railroad attempted to prevent the loading of its cars to certain other railroads because they had not promptly returned its cars, the commission held that the present rental and rules are sometimes not equal to the necessities of the situation and do not fully comply with the duties imposed by the act. Instead of an orderly system of

*An address before the Traffic Club of New York, December 30, 1913.

car interchange carried out in good faith, we find in this case one road stealing its equipment from its connections by way of reprisal against similar thefts of which it is the victim. The result is that the coal company in Illinois which has undertaken by contract to serve industries in Missouri is cut off from its market by reason of the closing of the routes which the law requires shall be kept open. "Such methods," says the commission, "are not the expression of civilization which leads to order, system and certainty, but are the loose and archaic methods of a disorganized industrial system. If it had made proper conditions attaching to the return movement of its cars, no such condition would have arisen as made this embargo necessary." This case related to coal cars, and the commission made no order at that time, "relying upon the good faith of the carriers under the law as herein presented to make such regulations for car interchange and for the maintenance of the through routes involved as may be needed." I believe the carriers have been more successful with respect to open cars in the application of present rules, and this raises the point that there are various kinds of traffic to be served and whatever is done should be after due consideration of this fact. It seems to me there should be a system of car interchange which would relieve the carriers throughout the country from the obligation of sending home all kinds of cars, and on the other hand absolutely enforce the sending home of cars of a special character on which the owning roads are entirely dependent for the handling of a particular kind of business. I do not overlook the desire of some railroads to have the use of their own box cars, some of which are of greater capacity than the cars of other roads, but there is no rule today that guarantees this.

Per diem rule 19 of the American Railway Association provides for a commission to supervise the observance of car service rules. This commission is empowered to examine the records of any carrier and decide complaints relating to the abuse of cars between carriers. In a recent report, after disposing of several cases involving open cars, it was stated with respect to the box car situation: "The commission fears, however, that the sudden enforcement of drastic measures tending to return box cars to their owners without regard to the traffic which offered would result in a decrease in the loaded mileage of box cars. While such a course might fill the present shortages somewhat, it would infallibly result in new and greater shortages at all points in the country." Is not this equivalent to saying that in actual practice and in the ordinary course of business, box cars naturally move to the centers where they are mostly needed, which is what they should do; and yet an absolute enforcement of present rules would bring the opposite result? The Car Service Commission expressed the opinion that conditions could be met by some better method than a blind enforcement of Rule 19, and that having had the benefit of this experience and concentrated study of car service under existing conditions, it formulated for its own guidance some general principles for the further study of the problem. It divided equipment into two classes: special equipment, or open cars, which necessarily involve considerable empty return movement; this equipment it was thought could be effectively regulated by rule 19. Legal tender equipment, or box cars, which cannot be effectively regulated by rule 19, because the practice of the home route in the case of box cars is an economic waste, from which it has developed in practice that there is in effect today a pool of legal tender equipment, but without regulation, and in its results unjust in times of car shortage to originating lines which have provided their quota of cars and to the public served by those lines, and during times of car surplus to distributing lines. It was stated that their proper regulation could be made effective only by the abandonment of the right to physical return to the owner of its own cars and the substitution of a plan which would give to each road the equivalent of its own cars.

The adoption of uniform standard specifications for box cars was strongly urged, and it was pointed out that car builders could have produced all the box cars built in 1912 at a saving of more than $7,000,000 in capital investment had they been working on uniform specifications. This, however, is not the first time it has been suggested by men of wide experience in the operation of railroads that box cars should be pooled. The subject has been discussed more or less for some years and the opinion frequently expressed that pooling should be tried. Objections have been made to pooling box cars on the ground that roads which have invested large sums in equipment have done so for the purpose of protecting the shipping interests of their own lines. Other roads, either from lack of capital or for other reasons, have not provided their quota of equipment; and then again cars recently built are quite different from old cars in many respects. Their cubic capacity and weight capacity are greater. How could these new cars be pooled and placed on a parity with old ones? And then there are the various kinds of cars—open cars, closed cars and equipment which is special in some particular. How can all these cars be pooled and considered legal tender one for the other? Nevertheless, it is a fact that there is no rule today that guarantees absolutely to any railroad the use of its own cars. There would probably have to be more than one group if all the cars were pooled, as whatever action is taken should be such as to emphasize and not minimize the necessity of keeping cars of a special character in the service for which they are intended. However, we believe these questions are such as to be expected in the first consideration of a subject and that they do not offer insurmountable objections to pooling. The management could hardly be perfect at the start and any new plan is open to so many questions that it is difficult to answer them; but this is a problem whose solution promises so much benefit to railroads and shippers that it seems to me a real effort should be made to work out the details and try it. I believe a plan could be formulated if it was made the particular business of some one, two or three men to go ahead and do it. Just now it is one of those things which concerns a great many, but is nobody's particular business to start. It is something like the uniform classification which was thought impossible and was until capable men were assigned to the task of making it.

Car shortage is a serious condition which confronts the railroads and business interests periodically. It is claimed by some that "car shortage" is a misnomer for these occurrences and that they are due rather to a lack of motive power, terminal facilities, efficient handling and prompt loading and unloading. All these things undoubtedly enter into the question. But it is at such times also that the present car service rules appear at their worst. With heavy traffic to move there is much handling and switching in the effort to furnish cars of certain ownership for the various loads. All this adds to congestion. There are times when one territory will have a surplus of empty cars and a serious shortage at the same time, because the empties cannot be used in the direction the shipments are to take. It has seemed to shippers that there is something wrong with a system that prevents the use of the cars which are at hand and readily available. Cars are frequently placed for competitive reasons, and under such circumstances one car that could run over any line would take the place of two or three cars furnished by competing lines.

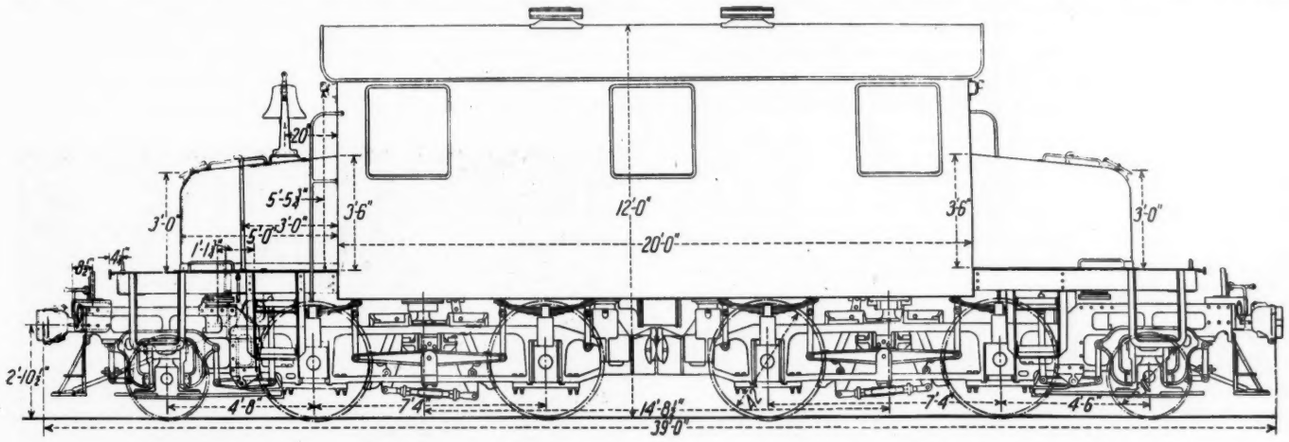
So it seems to me that this is one of the "current transportation problems" that our members, both shippers and railroad men, could well consider with a view of noting whether present rules are as well adapted to their own conditions as they might be. It would appear that there is a possibility of giving shippers better service and at the same time eliminating empty hauling, switching, car accounting, and the relief of terminals, all of which are important items of railroad expense.

Railway Construction in France.—It is reported that an agreement has been arrived at between the management of the state railways of France and the Ministry of Public Works whereby a new railway will be constructed from Cherbourg to Bordeaux via St. Malo and Nantes.

HIGH-SPEED ELECTRIC PASSENGER LOCOMOTIVES

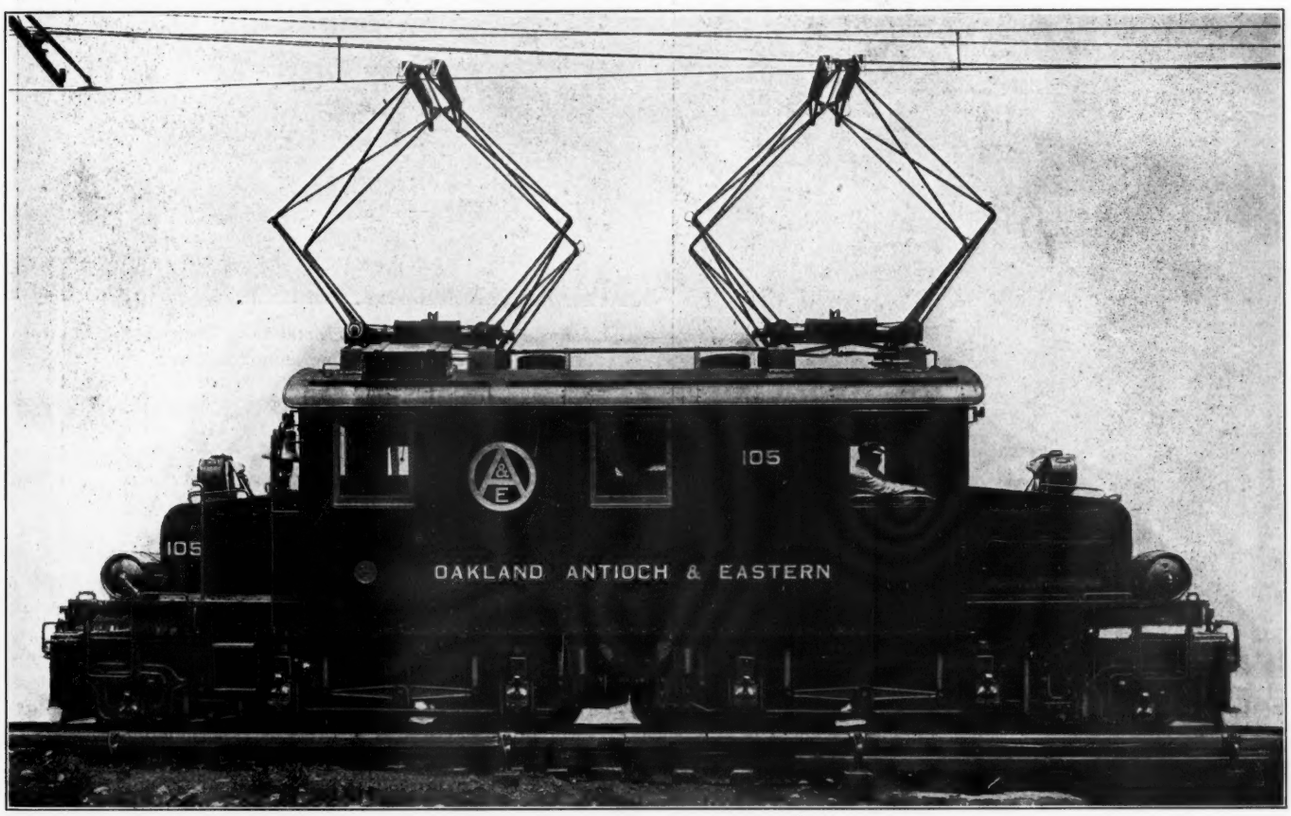
Business has increased so rapidly since the opening of the Oakland, Antioch & Eastern Railway that in order to cope with the heavy through passenger traffic between San Francisco and Sacramento, it has been necessary to place in operation two 62-ton electric locomotives. These are of the 2-4-0 articulated truck type and each is equipped with four Westinghouse No. 308-D-7, 250 h. p., 600-1,200-volt commutating-pole motors and type HLF unit switch control. Each locomotive when operating at a balancing speed of approximately 56 m. p. h. is capable of hauling a train of five steel passenger trail cars, weighing 37.5 tons each, on a level tangent track with 1,100 volts direct current on the trolley. With only three of these cars, one of these locomotives under the same track conditions is able to attain a balancing speed of about 60 m. p. h.

There are two articulated trucks each having six wheels, four of which are drivers, making a total of eight drivers per locomotive. Each group of wheels, consisting of two pairs of driving wheels and one two-wheeled radial truck, has an independent frame. The two truck frames are connected together by an articulation link. The cab is mounted on a separate frame which is supported on the truck frames by eight spring loaded friction plates, no drawbar pull being transmitted through the cab. The cab center pins carry no weight and are used simply to maintain the position of the cab with respect to the trucks.



General Arrangement of High Speed Electric Passenger Locomotive for the Oakland, Antioch & Eastern

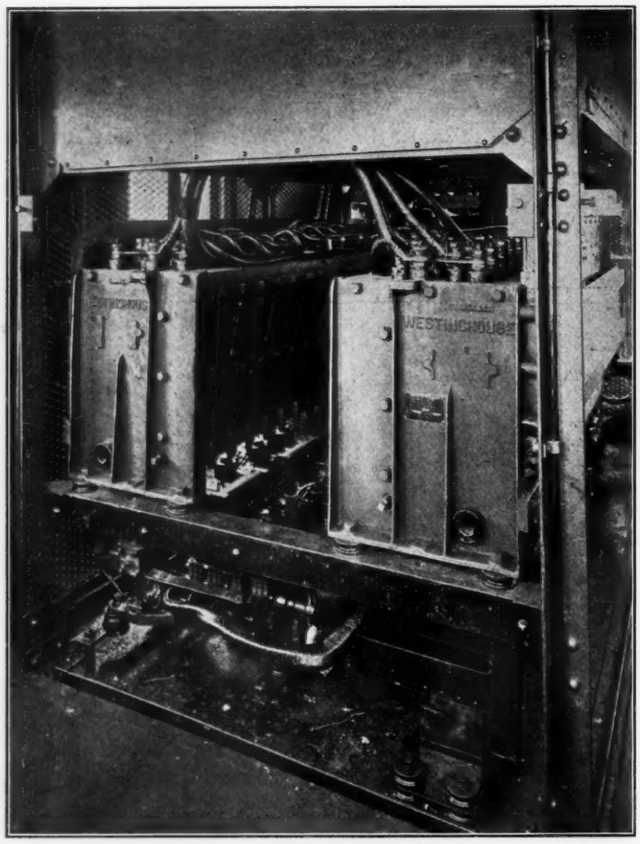
The truck side frames are steel castings of the steam locomotive type, 3½ in. wide, with their centers 76 in. apart transversely. The frames have renewable wearing gibs on the pedestals, and are designed in accordance with steam locomotive practice, except that in the present instance, it is unnecessary to use a tempered pedestal and wedge. The two-



Electric Locomotive Designed to Haul Five Steel Passenger Cars, Weighing 187.5 Tons, at a Speed of 56 m. p. h. on a Level Tangent with 1100 Volts Direct Current

wheel trucks under the ends of the locomotive are of the modified Rushton type with radius bars, and are equalized with the driving wheels. In each group of wheels, the equalization is continuous on both sides of the locomotive. The truck frames are strongly braced transversely at each end, and also at two intermediate points. The cross ties at the inner ends of the frames have radial faces which bear against each other. They are provided with spring buffers placed 38 in. apart. In negotiating curves, the inside buffers are compressed, thus tending to restore the alinement of the frames after the curve has been traversed. These buffers, being in contact at all times, also help to promote steady riding when passing over rough tracks.

The cab underframe is a built-up structure composed of channels, plates and angles. The longitudinal sills are four in number and consist of 8-in. channels which are 33 ft. 11¼ in. long. The width over the outside channels is 8 ft. 10 in. This structure is spring supported at eight points, four on each truck frame. The end supports are 37 in. apart transversely, and the center supports are 90 in. apart. Longitudinally the center supports are placed close together, as they are mounted near the ends of their respective truck frames. With this arrangement a minimum amount of shock is transmitted to the cab frame when the locomotive is running, and at the same time the trucks are maintained level under conditions of weight transfer due to the high tractive effort exerted by the motors.

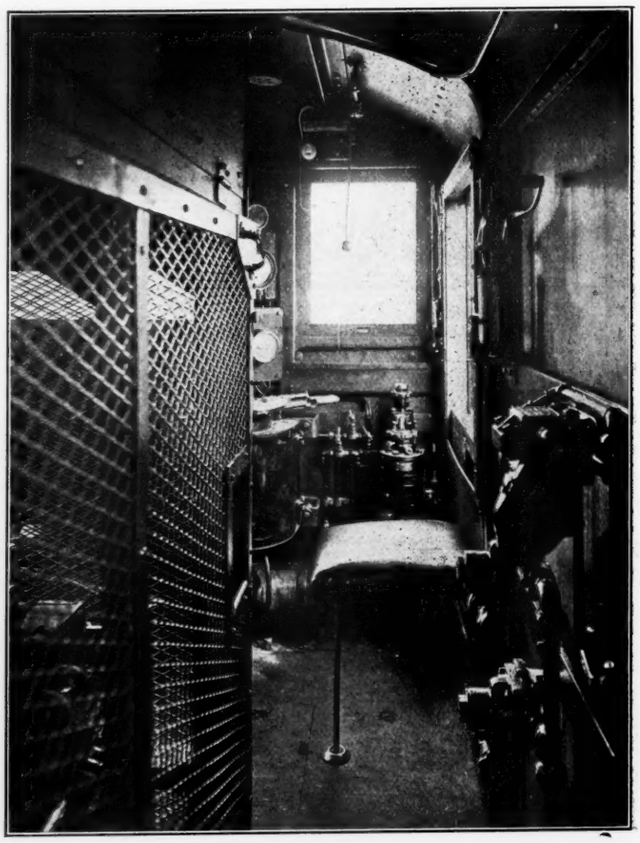


Switch Groups in Center of Locomotive; Part of Expanded Metal Cage Has Been Removed

The center pins which hold the cab frame in alinement with the trucks are 14 ft. 8½ in. apart. One of these pins is allowed a limited amount of longitudinal movement in the center plate on the cab frame. This is in order to compensate for the varying distance between truck centers when the locomotive is traversing curves, and to relieve the cab frame from buffing shocks.

The cab is of steel plate and has a hardwood floor. It is arranged for double end operation, and is provided with a convenient arrangement of doors and windows, which are of such size that all the cab equipment may be removed through them. All walking platforms outside the cab are of rolled steel checker plate.

The couplers have radial drawbars provided with centering springs. This is an important feature, as in service the locomotives traverse curves of 100-ft. radius. The equipment also includes air sanders, front and back, and combined air and hand brakes on all driving wheels. The driving wheels have cast iron centers with steel tires shrunk and bolted; while the truck wheels are of rolled steel. The mechanical parts of the locomotive were built by the Baldwin Locomotive Works.



Cab Interior Showing Expanded Metal Cage Surrounding Control Apparatus; also Operating Equipment

The principal dimensions of these locomotives are as follows:

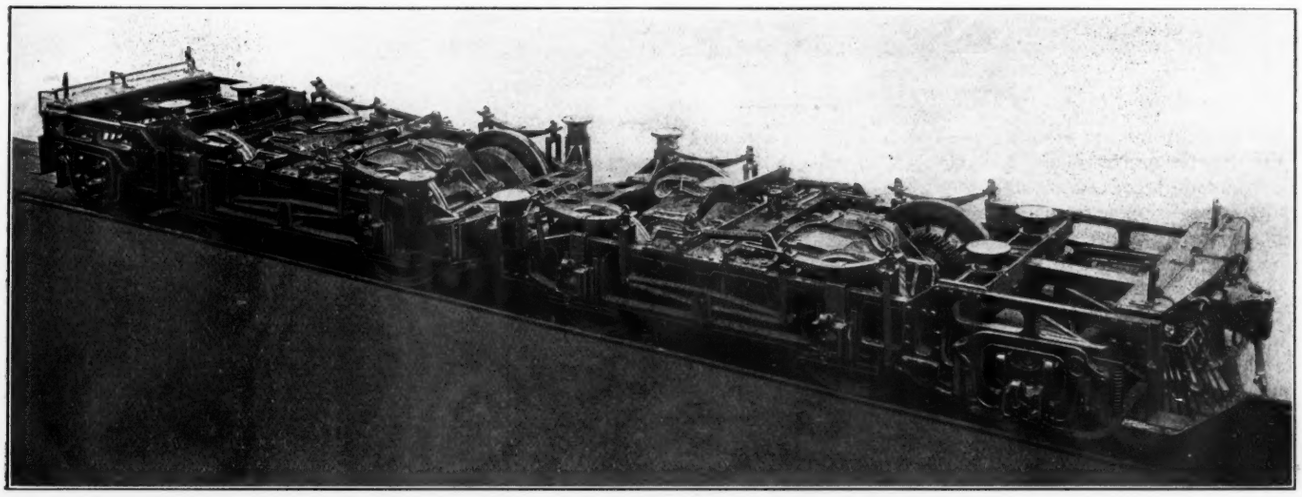
Gage	4 ft. 8½ in.
Wheel base, rigid	7 ft. 4 in.
Wheel base, total	31 ft.
Driving wheels, diameter outside	42 in.
Driving wheels, diameter center	37 in.
Driving journals	5 in. x 9 in.
Truck wheels, diameter	30 in.
Truck journals	4½ in. x 8 in.
Width over all	10 ft.
Height to top of cab	12 ft.
Length center to center of coupler knuckles	39 ft.
Weight on driving wheels	86,000 lb.
Weight, total engine	124,000 lb.

The control for the traction motors is of the Westinghouse unit switch field type, similar to the type HL, except that the field control takes care of the extra field tap of the motors. With this type of control the time of acceleration during which running on resistance is necessary is considerably reduced. The control equipment is mounted in a grounded expanded metal cage which protects the apparatus and yet allows it to be accessible for maintenance and inspection, thus greatly assisting in insuring reliable operation and continuity of service.

In the right hand corners of the cab are mounted the master controller, engineer's brake valve and sander valves. The reversers, or series parallel switches, are placed next to the floor, the switch groups and line switches directly over them, and the

resistors directly over the switch groups under the roof. The grid resistors are mounted in the main cab over the switch groups and are enclosed in a steel cabinet open at the bottom and provided with hinged doors on each side so as to provide easy access. Ventilators are provided in the roof over the resistance cabinet of such a type as to give free egress to the heated air and to prevent rain from entering. Forced ventilation is supplied by blowers mounted on the extended shaft of the dynamotors.

The advantages of this centralized arrangement are numerous and may be briefly summed up as follows: All the control apparatus is assembled compactly in one part of the locomotive instead of being scattered in different locations. The switch groups are located so that they are readily accessible from all sides and are at such a height that a man can get at them freely without working in a cramped position, or inside the hood. The resistance being located above the switch groups under the roof reduces the length of connections between the two pieces of apparatus to a minimum, and at the same time the heat rising from the resistances passes directly out through ventilators in the locomotive roof and very little of it reaches the switch groups. The reversers and series-parallel switches are mounted where they are readily accessible and are centrally located relative to the motors and near enough to them so that the amount of cable required is reasonable. The air brake distributing valve is located inside the cab where it will be kept sufficiently warm to prevent freezing; at the same time it is easily accessible. The location of the compressor in the hoods removes the feature of objectionable noise inside of the cab, and at the same time places them in a position where they can be easily lifted out by merely taking off the hood without disturbing any other apparatus. The motorman is located where he has a clear view of the track.



Running Gear of Oakland, Antioch & Eastern Electric Locomotive

Each locomotive is propelled by four Westinghouse 250 horsepower motors. These are of the commutating-pole box frame type arranged for field control. The field of each motor has four coils, each of which is divided into two parts, one having a greater number of turns than the other. These two coils are insulated from one another, but are bound so as to make one unit. Since they are of the field control type the field coils are connected in two circuits, one made up of the coils having the larger number of turns and the other of the coils with the least number of turns. In accelerating where a large tractive effort is needed, both these field circuits are connected in series, thus giving a strong field; after the motors get up to speed, the circuit containing the coils with the fewer number of turns is cut out; then the motors operate on short field.

Two dynamotors are mounted on each locomotive. These operate the compressors and blowers and supply the required amount of 600-volt direct current for lighting the passenger cars, the locomotive, headlight and for operating the control. Each compressor has a capacity of 35 cu. ft. of free air per minute. The air brakes, built by the Westinghouse Air Brake Company, are of the type EL especially designed for electric locomotive service. Each locomotive is equipped with a hand brake for holding the locomotive when stored.

RAILWAY CONDITIONS GOVERNING ELECTRIFICATION

The Institution of Electrical Engineers of England expects to hold six meetings in London during February, March and April, at which the various aspects of railroad electrification will be discussed. The series was opened on February 12 by a general paper entitled "Some Railway Conditions Governing Electrification," which was prepared by Roger T. Smith. His conclusions are as follows:

"To sum up the position as it appears to the author—the inherent advantages of the electric locomotive for goods (freight) and mineral haulage are, first, its ability to haul up to the maximum strength of the draw-gear at more than double the speed possible with the most powerful steam locomotive which can be built within British load gages; second, the ability, if necessary, to have all axles driven, so that the whole weight of the locomotive is available for adhesion while the weight per axle is sensibly reduced; third, the advantage that any driver (engineman) can work any locomotive, which is not the practice in this country with steam locomotives; fourth, the ability to run annually at least twice as many train-miles as the steam locomotive, partly due to increased speed and partly due to less time spent in the repair shops and for cleaning; fifth, the saving of all coal wasted by the steam locomotive when getting up steam, standing under steam, and left in the firebox at the journey's end, with the result that with electrical energy at ½d. (1 cent) per kilowatt-hour the bill for current per mile is about the same as the bill for coal and water per mile; sixth, the possibility, when the strength of the draw-gear permits, of loads being hauled quite beyond the capacity of any steam locomotive that can be built within our load gages. The electric locomotive takes its power from a generating station and not from a moving boiler; it can therefore be designed to give its maximum drawbar pull at any desired speed. It is for the electrical engineer to make the most of such advantages."

Other papers in the series which have been announced are "Motor and Control Equipment for Electric Locomotives," by F. Lydall; "Rolling Stock and Its Design and Influence on the Energy Consumption of Trains," by H. E. O'Brien; "The De-

sign of Traction Motors for Alternating and Continuous Currents," by Professor Miles Walker; "Electric Signaling on Railways," by H. G. Brown; and "Electrification of Railways as Affected by Traffic Considerations," by H. W. Firth.

ACCIDENT BULLETIN NO. 48; YEARLY RECORDS

The Interstate Commerce Commission has issued Accident Bulletin No. 48, containing the record of railroad accidents in the United States during April, May and June, 1913, and the year ended June 30, 1913. The number of persons killed in train accidents during the months of April, May and June, 1913, was 152, and of injured, 3,417. Accidents of other kinds, including "industrial" accidents, bring up the total number of casualties to 2,535 killed and 49,911 injured. The principal items for this quarter, compared with the preceding three months and with one year ago, appear as follows:

TABLE No. 1A.—*Condensed summary of fatalities*

No.	Item	Bulletin No. 48	Bulletin No. 47	Bulletin No. 44
1	Passengers killed in train accidents	21	15	14
2	Passengers killed, all causes	64	68	52
3	Employees (on duty) killed in train accidents	101	132	99
4	Employees (on duty) killed in coupling	46	62	46
5	Employees (on duty) killed, total (Table 1B)	628	734	554
6	Total passengers and employees (items 2 and 5, above)	692	802	606
7	Other persons killed (including trespassers, nontrespassers, and employees not on duty), all causes	1,746	1,442	1,696
8	Employees killed in industrial accidents	97	97	93
	Grand total (items 6, 7, and 8)	2,535	2,341	2,395

The total number of collisions and derailments reported for the quarter under review was 3,596 (1,389 collisions and 2,207 derailments), of which 148 collisions and 202 derailments affected passenger trains. The damage to roadway and equipment and the cost of clearing wrecks resulting from these accidents amounted to $3,234,289.

Electric Railways reporting to the commission (not included in the foregoing statistics) had 127 persons killed during the quarter and 1,245 injured, and there were 33 collisions and 17 derailments. Train accidents are charged with six fatalities. The total number of passengers killed on electric roads from all causes was 11, and of employees 22 (four in industrial accidents). The number of trespassers struck or run over by cars was 25 killed and 20 injured.

ANNUAL TABLES—STEAM RAILWAYS

The total number of casualties to persons reported for the year was 211,272; 10,964 killed and 200,308 injured. These figures show an increase over 1912 of 379 in the number of persons killed and 30,770 in the number injured. The total includes 414 employees killed and 113,620 employees injured in "industrial accidents." The principal facts of the year (except the industrial accidents) are shown in Table 1B and Table 2, reproduced herewith. (Table 1B for the preceding year will be found in the *Railway Age Gazette*, January 10, 1913, page 65. In that table the last line, "grand total," contains a number of errors.)

ANNUAL TABLE No. 1C.—*Comparisons with* 1912

No.	Item	1913 Killed	1913 Injured	1912 Killed	1912 Injured
	Passengers:				
1	In train accidents	181	8,662	139	9,391
2	Other causes	222	7,877	179	6,995
	Total	403	16,539	318	16,386
	Employees on duty:				
3	In train accidents	557	6,905	596	7,098
4	In coupling accidents	195	3,360	192	3,234
5	Overhead obstructions, etc	94	1,835	77	1,523
6	Falling from cars, etc	560	16,005	573	13,874
7	Other causes	1,533	28,514	1,482	23,391
	Total	2,939	56,619	2,920	49,120
	Total	3,342	73,158	3,238	65,506

ANNUAL TABLE No. 1B.—*CASUALTIES TO PASSENGERS, EMPLOYEES, AND OTHER PERSONS—YEAR ENDED JUNE 30, 1913.*

Causes	Passengers		Passengers on freight trains		Persons carried under agreement		Total		Trainmen		Trainmen in yards		Yard trainmen		Switch tenders, crossing tenders and watchmen		Trackmen and bridgemen		Other employees		Total employees on duty		Employees not on duty		Other persons not trespassing		Trespassers		Total persons	
	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd
Train accidents																												
Collisions	119	3,502	3	136	19	432	141	4,470	162	1,824	33	499	53	624	...	8	19	191	13	221	280	3,367	6	88	5	73	25	33	457	8,031
Derailments	22	3,513	4	209	13	354	39	4,076	169	1,418	6	157	23	291	1	6	17	188	11	183	227	2,243	6	48	3	31	59	136	334	6,534
Misc. train accidents	96	1	4	...	10	1	110	4	179	...	40	2	38	...	.....	2	20	1	16	9	293	.....	6	1	3	4	3	15	415
Bursting of boilers	4	...	.....	...	2	...	6	34	651	...	2	164	2	160	...	1	....	2	26	41	1,002	.....	4	.....	3	2	2	43	1,017
Total train accidents	141	7,515	8	349	32	798	181	8,662	369	4,072	41	860	80	1,113	1	15	39	399	27	446	557	6,905	12	146	9	110	90	174	849	15,997
Other than train accidents																												
Accidents to roadway or bridges not causing derailment	...	.....	...	.....	...	.....	...	.....	...	4	...	1	...	5	2	.....	1	.....	4	7	7	17	.....	.....	.....	1	1	.....	8	18
Coupling or uncoupling cars	...	.....	...	.....	...	.....	...	.....	40	873	40	581	104	1,839	...	4	...	3	11	60	195	3,360	.....	1	.....	.....	.....	195	3,361
Other work about trains, etc.	...	.....	...	.....	...	.....	...	.....	45	13,089	35	4,219	62	6,656	...	135	1	1	...	14	143	24,114	.....	.....	.....	.....	.....	143	24,114
Coming in contact with overhead bridges, etc.	3	20	1	.....	1	9	5	29	53	806	14	313	13	662	...	2	4	5	10	47	94	1,835	2	9	1	7	44	99	146	1,979
Falling from cars or engines	47	271	2	19	8	32	57	322	172	2,437	68	1,210	114	2,615	3	12	20	114	29	259	406	6,647	20	59	14	72	407	559	904	7,659
Getting on or off	85	2,616	2	52	3	49	90	2,717	50	3,588	23	1,611	36	3,455	1	50	19	227	25	427	154	9,358	45	349	10	134	544	1,928	843	14,486
Other accidents on or around trains	4	3,094	1	299	3	501	8	3,894	...	7	...	17	1	9	...	72	11	562	54	1,292	66	1,959	4	207	13	880	55	382	146	7,322
Being struck or run over at stations or yards	44	124	...	3	4	7	48	134	67	134	78	183	108	403	71	103	200	358	228	483	752	1,664	122	138	124	306	1,180	1,232	2,226	3,474
Being struck or run over at highway grade crossings	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	.....	.....	3	12	977	2,896	145	172	1,125	3,080
Being struck or run over at other places	4	3	...	...	2	2	6	5	72	76	...	...	4	4	47	35	354	292	67	83	544	490	143	66	91	134	2,960	1,438	3,744	2,133
Other causes	8	764	...	1	...	11	8	776	1	56	5	46	5	49	...	28	2	28	8	63	21	270	11	191	49	1,502	132	326	221	3,065
Total (last 11 items)	195	6,892	6	374	21	611	222	7,877	500	21,070	263	8,181	447	15,697	124	441	612	1,590	436	2,735	2,382	49,714	350	1,032	1,279	5,932	5,468	6,136	9,701	70,691
Grand total	336	14,407	14	723	53	1,409	403	16,539	869	25,142	304	9,041	527	16,810	125	456	651	1,989	463	3,181	2,939	56,619	362	1,178	1,288	6,042	5,558	6,310	10,550	86,688

No.	Item.	1913 Killed	1913 Injured	1912 Killed	1912 Injured
	Employees not on duty:				
8	In train accidents	12	146	20	156
9	In coupling accidents	...	1	...	2
10	Overhead obstructions, etc	2	9	1	12
11	Falling from cars, etc	65	408	53	312
12	Other causes	283	614	241	477
	Total	362	1,178	315	959
	Other persons, not trespassing:				
13	In train accidents	9	110	13	277
14	Other causes	1,279	5,932	1,185	4,746
	Total	1,288	6,042	1,198	5,023
	Trespassers:				
15	In train accidents	90	174	91	151
16	Other causes	5,468	6,136	5,343	5,536
	Total	5,558	6,310	5,434	5,687
	Total accidents involving train operation	10,550	86,688	10,185	77,175
17	Industrial accidents	414	113,620	400	92,363
	Grand total	10,964	200,308	10,585	169,538

The bulletin next gives a dozen pages of tables classifying personal casualties in great detail, including two tables in which the figures for men in passenger train service are shown separately from those for men in freight train service. Other tables contain summaries of the cost of collisions and derailments, as given in the quarterly bulletins, for twelve years back.

The reports of the electric railways for 1911, 1912 and 1913 show:

ANNUAL TABLE NO. 1CE.—*Electric railways*

	1913 Killed	1913 Inj'd	1912 Killed	1912 Inj'd	1911 Killed	1911 Inj'd
Passengers	36	3,041	35	2,862	105	2,283
Employees on duty	50	548	46	439	51	363
Employees not on duty	3	28	1	24	4	18
Other persons, not trespassing	197	868	118	659	133	481
Trespassers	117	123	100	128	117	119
Total	403	4,608	300	4,112	410	3,264
Industrial accidents	19	798	24	550	10	399
Grand total	422	5,406	324	4,662	420	3,663

EMPLOYEES IN SERVICE

The total number of railway employees in service June 30, 1913, was 1,848,883, or 119,739 more than one year before.

Employees in service of steam railways on June 30, 1913.

No.	Class of employees	Number of persons
	Employees specially exposed to railway accidents:	
1	Freight trainmen, road service (enginemen, firemen, motormen, conductors, brakemen, rear flagmen, train baggagemen, train porters performing duties of trainmen)	181,929
2	Passenger trainmen, road service (enginemen, firemen, motormen, conductors, brakemen, rear flagmen, train baggagemen, train porters performing duties of trainmen)	69,182
3	Other persons employed on trains (dining-car employees, train porters not performing duties of trainmen, etc., when actually employed by the respondent carrier)	13,500
4	Yardmen (all employees in yard train work and switching: enginemen, firemen, conductors, brakemen, foremen, droppers, fieldmen, hostlers, hostler helpers, yardmasters, etc.)	117,259
5	Switch tenders, crossing tenders, and watchmen	32,510
6	Bridgemen and trackmen	508,532
7	Other employees (station and miscellaneous employees, shopmen, etc., excluding all officers, clerks, indoor employees, and others engaged in work in which they are not specially exposed to railway accidents)	378,255
	Total	1,301,167
8	Employees not specially exposed to railway accidents (includes officers and other employees specifically excluded from item No. 7 above)	547,716
	Total number of persons employed on June 30, 1913	1,848,883

In the table next following we have for the first time the ratios of freight train men killed and injured, separated from the statistics of all others, including passenger train men, from which it appears that an average of *one out of every six* of these men is injured each year.

Ratios of Casualties

Class of employees	Number employed June 30	Killed	Injured	Number employed for one killed	Number employed for one injured
Freight trainmen	181,929	1,006	30,179	181	6.0
Passenger trainmen	69,182	167	4,004	414	17.3
Yardmen	117,259	527	16.810	223	6.9
Switch tenders, crossing tenders, and watchmen	32,510	125	456	260	71.3
Trackmen and bridgemen	508,532	813	27,358	626	18.6
Total employees specially exposed to railway accidents	1,301,167	3,715	171,417	350	7.6
Total employees in service	1,848,883	3,715	171,417	498	10.8

Following the statistics, the bulletin gives a summary of the reports of investigations made during the quarter ending June 30, to learn the causes of train accidents, together with a tabular statement of the main points of all investigations made since July 1, 1911.

RAILWAY SURVEY IN PERSIA.—It is reported that the various tribes along a portion of the route of the proposed railway from Mohammerah to Kharamabad are combining for the purpose of blackmailing the Anglo-Persian survey party consisting of four British engineers, a Belgian engineer representing the Persian government, and two assistants. This survey party commenced operations in October and has already traveled over the first part of the route from Mohammerah to Dizful without difficulty, and hoped next to survey the route from the latter point on to the end of the line, a section presenting greater engineering difficulties than the southern part. For the present, however, the party find themselves held up at Dizful by the insecurity of the country. The Persian railway syndicate is now making efforts to settle matters with the tribes so that there is every reason to believe that the survey will be completed before the end of this winter.

ANNUAL TABLE NO. 2.—*COLLISIONS AND DERAILMENTS—YEARS ENDING JUNE 30*

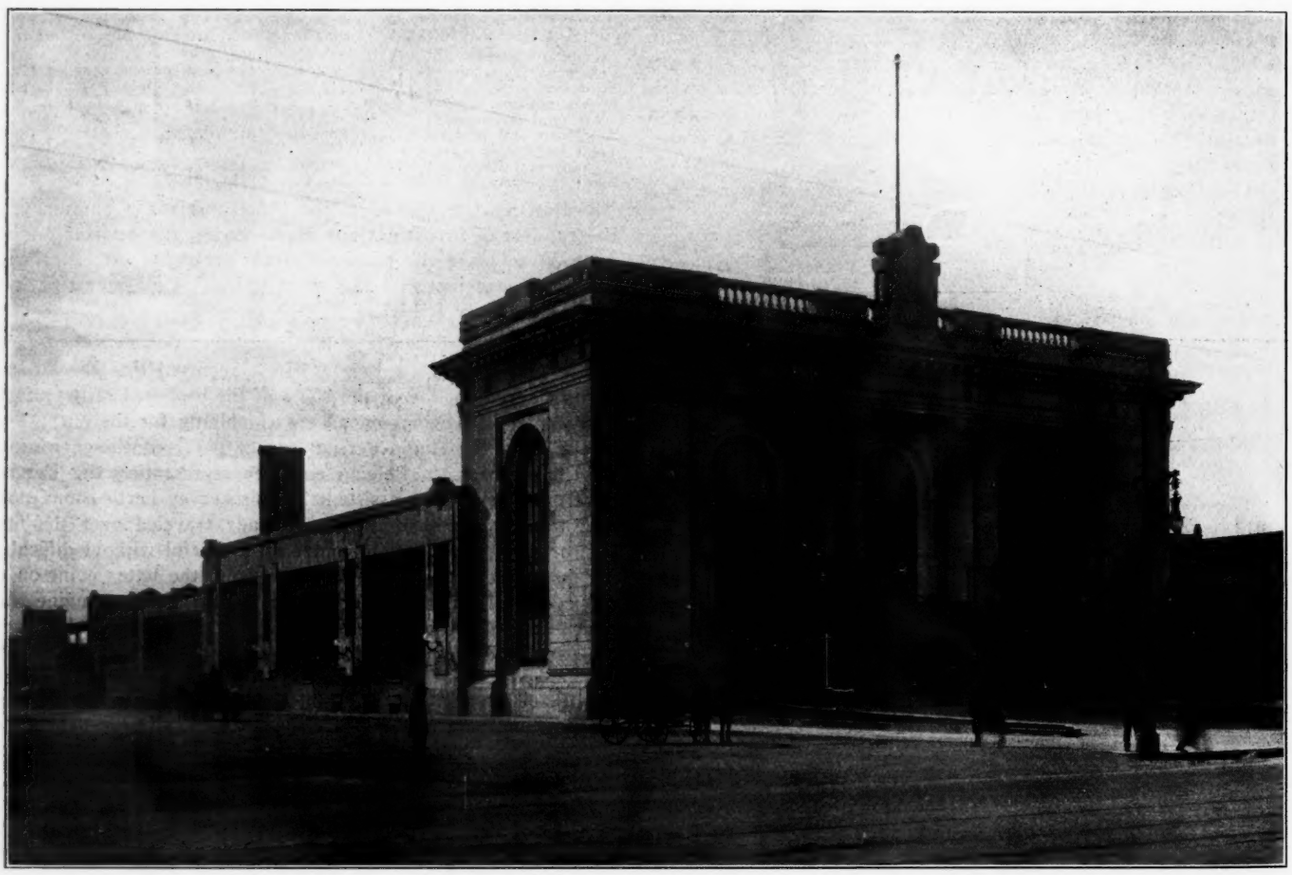
Classes.	1913 Number	1913 Number of persons—Killed.	1913 Number of persons—Injured.	1913 Damage to road and equipment and cost of clearing wrecks.	1912 Number.	1912 Number of persons—Killed.	1912 Number of persons—Injured.	1912 Damage to road and equipment and cost of clearing wrecks.	1911 Number.	1911 Number of persons—Killed.	1911 Number of persons—Injured.	1911 Damage to road and equipment and cost of clearing wrecks.
Collisions:												
Rear	1,143	183	2,251	$1,380,064	1,142	117	2,019	$1,292,885	1,099	109	1,526	$1,241,193
Butting	682	157	2,921	1,266,415	704	157	3,136	1,314,232	609	187	2,610	1,250,519
Trains separating	474	5	194	204,702	353	4	138	144,495	370	7	163	145,360
Miscellaneous	4,178	112	2,665	1,917,591	3,284	100	2,656	1,578,594	3,527	133	2,695	1,664,984
Total	6,477	457	8,031	4,768,772	5,483	378	7,949	4,330,206	5,605	436	6,994	4,302,056
Derailments due to—												
Defects of roadway	1,959	70	2,230	1,583,929	1,877	102	2,766	1,541,460	1,225	57	1,560	1,007,460
Defects of equipment	4,366	49	1,245	3,421,037	3,847	68	1,197	3,165,033	2,824	64	689	2,379,074
Negligence of trainmen, signalmen, etc	515	23	452	306,163	423	18	548	238,389	397	36	508	319,351
Unforeseen obstruction of track, etc	369	79	791	986,104	412	61	595	478,675	309	66	492	358,166
Malicious obstruction of track, etc	62	8	131	74,046	75	16	378	109,614	84	16	176	102,161
Miscellaneous causes	1,778	105	1,685	1,909,163	1,581	129	1,663	1,664,081	1,421	110	1,374	1,383,512
Total	9,049	334	6,534	8,280,442	8,215	394	7,147	7,197,252	6,260	349	4,799	5,549,724
Total collisions and derailments	15,526	791	14,565	13,049,214	13,698	772	15,096	11,527,458	11,865	785	11,793	9,851,780

Union Station and Track Elevation at Wichita

Four Roads Have United to Eliminate the Grade Crossings and to Provide Joint Terminal Facilities

By C. J. Skinner
Resident Engineer, Wichita Union Terminal Railway, Wichita, Kan.

The Wichita Union Terminal Railway Company, organized by the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the St. Louis & San Francisco, and the Kansas City, Mexico & Orient, is spending $2,000,000 for track elevation and passenger terminal facilities at Wichita, Kan., which work is now nearing completion. It is planned to open the station on Saturday, March 7. Douglas avenue, the principal business street of the city, was crossed at grade by the main lines of the Santa Fe, Rock Island and Frisco, within a distance of two blocks. The center of the city is about six blocks west of this point while there is a rapidly growing residence district east of the tracks. The primary object of this improvement was to abolish these grade crossings and the ordinance provides that all surface tracks shall be removed from Douglas avenue.



Front View of Wichita Union Station

UNION STATION AND EXPRESS BUILDINGS

The station, which fronts on Douglas avenue, is 260 ft. in length by 100 ft. in width. South of the station proper, buildings are provided for the accommodation of the Wells Fargo, the United States and the American Express companies. Quarters are also provided for the handling of mail.

It will be seen by the plan that the main waiting room is on the east side of the building and is not entered by passengers unless they wish to wait for trains. The ticket office fronts on the concourse and in addition the waiting room, dining room, news and parcels stand and the smoking room, are grouped about the concourse, while the baggage checking counter is at the end of a short passageway, just south. The telegraph office and telephone booths are also located on this passageway. There will be no seats in the concourse. On entering the depot a passenger will proceed directly to the ticket office, which is located directly opposite the entrance of the subway leading to the track platforms. Passengers coming from trains will proceed directly from the subways to the front door of the depot.

The station and express buildings are of reinforced concrete and are fireproof throughout. The Douglas avenue facade is of white stone, while the east and west elevations are of terra cotta. The interior of the station is also of white terra cotta, in harmony with the exterior. The station has marble floors throughout. As shown in one of the photographs, almost the entire east wall of the waiting room is composed of windows. Another pleasing architectural effect has been obtained by bush-hammering the beams which support the ceiling of the main waiting room and the concourse.

The fact that the tracks are elevated permits the construction of subways under the tracks with inclines leading to the

three platforms, 10 ft. above the level of the waiting room floor. The subways and inclines are finished in marble and tile, making them as light and attractive as any portion of the station.

The express buildings are fireproof throughout and are constructed of bush-hammered concrete and brick. The stalls for the sorting of express are of reinforced concrete. Each express building has a high platform and express can be handled across these platforms directly from the wagon to the trucks. These platforms are covered, as is also the space used for trucking purposes lying immediately to the west of them.

One elevator is provided in the baggage room and two for the express companies. These elevators are 16 ft. long and 6 ft. wide, and have a capacity of 10,000 lb. and a speed of 50 ft. per minute. The track platforms are so arranged that if desired separate platforms can be used for the handling of baggage and express. In addition to the inclines referred to above exits with turnstiles are provided which allow passengers from incoming trains to proceed directly to the sidewalk under the Douglas avenue subway.

Main Waiting Room of Wichita Union Station

A four-track main line extends the entire length of the elevation, consisting of a double freight and a double passenger main. At the depot, the passenger main lines expand into five through tracks. Three passenger spurs are also provided for branch line trains which terminate at Wichita. A small coach yard has also been provided at a point a short distance south of the station. At the north end of the terminal tracks connections are made with the Frisco, Rock Island and Santa Fe, and these connections are so planned that at the point where the tracks diverge, a four-track movement can be made. The same arrangement is provided at the connections at the south end. A complete all electric interlocking plant is being constructed at each end of the elevation.

TRACK ELEVATION

Although the track elevation work has been expensive, it has been completed at less cost than would ordinarily result owing to the fact that the area south of Douglas avenue was largely occupied by railway yards with no open street across the tracks between Douglas avenue and Kellogg street, a distance of one-half mile, and north of Douglas avenue the streets are spaced 600 ft. apart. The elevation of the tracks involved the construction of only three subways, at Douglas avenue and at First and Second streets, and one viaduct at Kellogg street, and only one street was closed. The viaduct at Kellogg street carries street traffic, not only over the terminal tracks, but also over the yards and tracks of the Santa Fe, Rock Island, Frisco and Orient. This viaduct is 2,200 ft. long and is of reinforced concrete except for six structural steel spans. The viaduct has a 26 ft. roadbed and one sidewalk 5 ft. in width. The maximum grade used is 6 per cent.

The Douglas avenue subway is 114 ft. in width and accommodates a double track street railway, two 29 ft. roadways and two 15 ft. sidewalks. The vertical clearance over the street car tracks is 13½ ft. and 12 ft. over the roadways. At First street there is a 30 ft. driveway and two 5 ft. sidewalks. At Second street a vertical clearance of 10 ft. over the driveway was adopted as a compromise.

The subways are designed for Cooper's E-60 loading and are constructed of plain 1:3:6 concrete with spread footings, with the tracks resting on 20 in. I beams, spaced 17 in. between centers. A 4½ in. concrete floor reinforced with rods and with triangular mesh is placed on the I beams, and is covered with 2 in. of asphaltic waterproofing, consisting of a priming coat, three layers of saturated burlap and one and one-half in. of asphaltic mastic. Six in. of ballast is placed between the ties and the waterproofing. Outside beams and columns on the subways are encased in concrete and the re-

mainder of the steel work has been painted a battleship gray.

Practically the entire cost of the track elevation has been borne by the railway companies, the city assuming the expense of lowering and paving the streets, building the sidewalks under the three subways and the incidental and consequential damages to the adjacent property. The city assumed the expense of constructing the abutments and pier foundations at Douglas avenue, which cost was finally borne by the street railway company. The city also pays one-third of the cost of the Kellogg street viaduct.

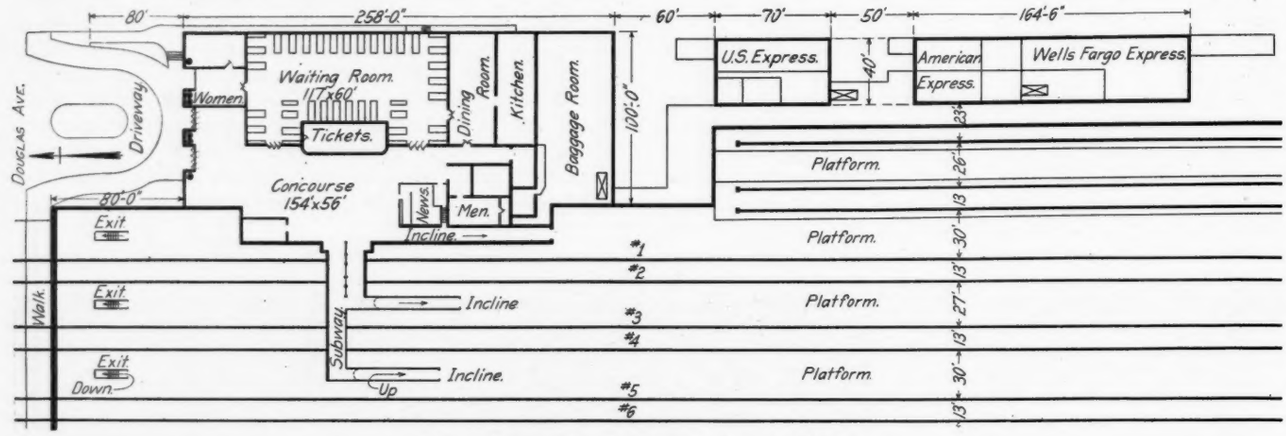
The track elevation embankment was built of sand pumped from the Arkansas river into dump cars which were hauled to the site of the work. This material was used in order to secure minimum settlement, which was an important consideration in constructing the track platforms at the station.

Douglas Avenue Subway

A complete system of drainage and manholes has been provided and connected with the sewer system.

As the greater part of the right-of-way of the terminal company was purchased from the Santa Fe, it was necessary to conduct the work with minimum interference with the traffic of this road. When the work on the retaining walls was started this traffic was thrown to the extreme west side of the property, and a temporary main line was constructed north from Douglas avenue. This enabled the retaining walls and a greater part of the subways to be completed without interference. In October the Santa Fe traffic was turned over the elevation, and the Santa Fe was provided with temporary quarters on the second floor of the station. This allowed the old Santa Fe passenger station and express buildings to be torn down, enabling the concrete work and grading just south of Douglas avenue to be completed.

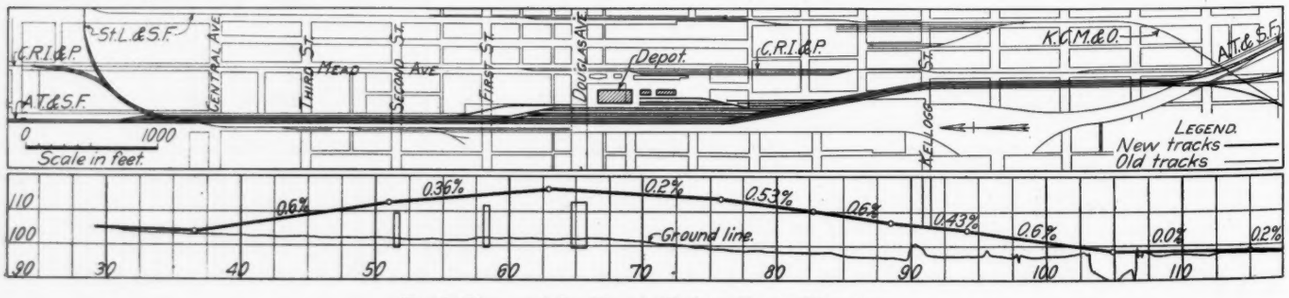
This work was practically all done by contract. The station and associated buildings were constructed by Dieter & Wenzel Construction Company of Joplin and Wichita, while the retaining walls, subways and other concrete work, comprising approximately 20,000 yards of concrete, were built by the Texas Building Company, of Fort Worth. Kilpatrick Bros., of Beatrice, Neb., did the grading and track laying.



Floor Plan of New Union Station at Wichita

Looking Down Concourse towards Baggage Room, with Ticket Office on Right and Passenger Subway on Left

The writer has been in charge of the entire work since the organization of the terminal company, reporting to a board of engineers, consisting of C. F. W. Felt, chief engineer of the Santa Fe system, chairman; J. M. Brown, engineer main-

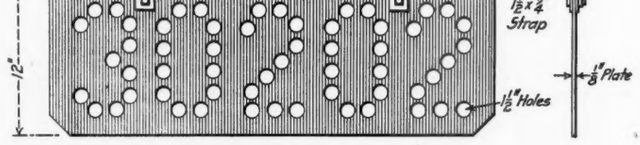


Track Plan and Profile of Wichita Track Elevation

tenance of way, Chicago, Rock Island & Pacific; M. C. Beyers, chief engineer of operation of the Frisco company, later succeeded by V. K. Hendricks, assistant chief engineer, and W. W. Colpitts, chief engineer of the Orient, later succeeded by H. Holmes, resident engineer. Louis Curtis, Kansas City, Mo., was architect of the station.

NEW YORK CENTRAL STANDARD SIGNAL PLATE

The illustration printed herewith shows the signal plate which has been adopted as standard on the New York Central & Hudson River. It is of iron, ⅛ in. thick and 12 in. wide. The length is proportioned to the number of figures to be shown, the plate in the illustration being 36 in. long. For a plate showing only four figures the length would be 29¼ in. In this particular number (30202) the first three figures are the number of the mile post, the fourth figure is the tenth and the fifth figure is the track number. The plate is hung from the signal bridge directly over the engineer's side of the track which the signal governs, or it is bracketed out from the signal post. Wherever there are two or more signals on a bridge, there is a sign plate for each signal, signs being so hung that they can be read by the engineman. The figures being perforated and of ample size are plainly seen against the prevailing sky background and by the light of the headlight. The holes of which the figures are made, are 1½ in. in diameter. No special painting is necessary and the coating of black paint forms a simple and durable means of preventing corrosion of the plate.



New York Central Signal Plate

There are two generally used systems of numbering, one known as the numerical system and the other the geographic or mile-post system. In the former the signals are numbered consecutively, beginning with No. 1 at the terminal of a division or of a railroad. This system is modified sometimes by giving the signals odd or even numbers corresponding with the system of train numbering, or a number is added designating the track which it governs. In the other system, the one here used, the signal is given a number showing the distance from a starting point in miles and tenths, the figures corresponding to those on the mile posts, showing the distance from a starting point, and a figure is added giving the track designation.

Calling attention to the value of numbers on signals, the correspondent who sends us this drawing says:

"The securing of accurate statistics as to the reliability of the performance of automatic signals, is at all times important. The questions may well be asked: how often do signals fail unnoticed? How often do signals fail unreported? Enginemen are expected to report any signal failure they notice. The difficulty of securing complete and accurate records in this way is realized when one considers the number and the details of cases of reported signal failures, which upon investigation prove to be instances where the signals have been working properly. For instance, under the normal danger system a broken rail causes the signal in advance to give the proceed indication with no train approaching; and the signal is reported out of order by the engineman of a train on an adjacent track.

"Enginemen, as a class, are possessed with the idea that there is as much frailty in the signal system as there is in human nature; and they will be found seeking evidence to prove it as a defense of some brother in trouble. It behooves all officers to provide every possible means for getting full, correct and prompt reports."

The design here shown is an amplification of one used on trolley cars suggested by C. E. Lindsay, division engineer, and elaborated by W. H. Elliott, signal engineer.

ANTHRACITE BURNING PACIFIC TYPE LOCOMOTIVE

In the *Railway Age Gazette* of October 13, 1913, page 704, a record run of a new Pacific type locomotive hauling the Black Diamond Express on the Lehigh Valley was described. Six of these locomotives are now running in passenger service on the division between Easton, Pa., and Sayre, a distance of 194 miles. The maximum grade on this division is between Mauch Chunk and Wilkesbarre, over the Wilkesbarre mountain. The grade between Mauch Chunk and Glen Summit (the top of the mountain) is 33.7 miles long, and has a maximum rise of 67 ft. to the mile, westbound. The grade between Wilkesbarre and Glen Summit is 19.6 miles long with a maximum of 95.7 ft. to the mile eastbound. The locomotives were designed to haul, unassisted, passenger trains weighing 550 tons westbound, and 360-ton trains eastbound, over this division. Heretofore it has been necessary to double head trains of these weights, using a Pacific type locomotive having a total weight of 241,300 lb. and a tractive effort of 31,600 lb., and a ten-wheel helping locomotive having a total weight of 199,500 lb. and a tractive effort of 31,400 lb.

The new Pacific type has a total weight of 262,000 lb. and a tractive effort of 41,500 lb., the factor of adhesion being 3.89. The total evaporative heating surface is 3,744 sq. ft. and, making the usual allowance for the superheater, the total equivalent heating surface is 4,962 sq. ft. This gives 8.35 lb. theoretical tractive effort per pound of equivalent heating surface. Special attention was given to the details of design, in order to obtain the maximum tractive effort at high speeds per pound of total weight of locomotive. On account of the low factor of adhesion it was necessary to design the valve gear to obtain a rotative effort as nearly constant as possible, thereby keeping the factor of adhesion very close to the theoretical. Piston valves 14 in. in diameter are driven by Walschaert valve gear. The valves have a travel of 6 in., a steam lap of 1¼ in., an exhaust clearance of ⅛ in. and a lead of 5/16 in. The large amount of lap is apparently responsible for the even turning movement.

A screw reverse gear is used, and on account of the extreme width of the firebox it was necessary to insert a universal joint in the reach rod just ahead of the bearing at the front end of the firebox.

The tender cistern construction* follows a new departure which requires the top and bottom sheets of the cistern to be flanged and riveted to the side and end sheets, thus eliminating the angle iron connection and all rivet holes through the bottom of the cistern. This construction not only reduces the first cost, but also gives a lower cost of maintenance.

Following are the leading dimensions of these locomotives:

General Data

Gage	4 ft. 8½ in.
Service	Passenger
Fuel	Anthracite
Tractive effort	41,597 lb.
Weight in working order	262,160 lb.
Weight on drivers	161,940 lb.
Weight on leading truck	49,420 lb.
Weight on trailing truck	50,800 lb.
Weight of engine and tender in working order	404,860 lb.
Wheel base, driving	13 ft. 8 in.
Wheel base, engine and tender	76 ft. 4⅜ in.

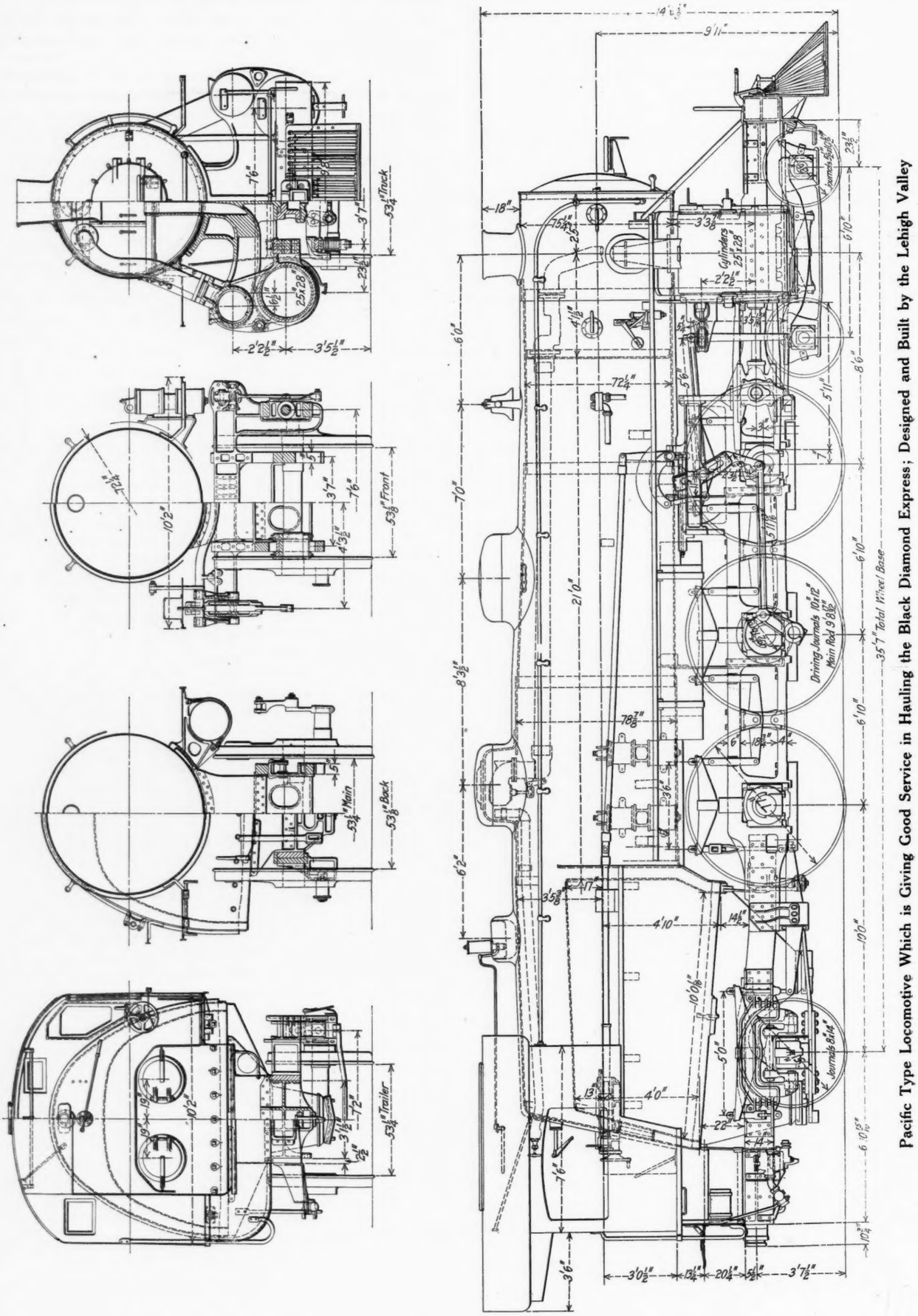
Cylinders.

Kind	Simple
Diameter and stroke	25 in. x 28 in.

Valves.

Kind	Piston
Diameter	14 in.
Greatest travel	6 in.

*See *Railway Age Gazette, Mechanical Edition*, February, 1914, page 72.



Pacific Type Locomotive Which is Giving Good Service in Hauling the Black Diamond Express; Designed and Built by the Lehigh Valley

Steam lap	1¼ in.
Exhaust clearance	⅛ in.
Lead	5/16 in. constant

Wheels.

Driving, diameter over tires	77 in.
Driving journals, main	10 in. x 18 in.
Driving journals, others	10 in. x 12 in.
Engine truck wheels, diameter	36 in.
Engine truck journals	5½ in. x 10½ in.
Trailing truck wheels, diameter	51 in.
Trailing truck journals	8 in. x 14 in.

Boiler.

Style	Wooten
Steam pressure	215 lb.
Outside diameter of first ring	72¼ in.
Firebox, length and width	126⅛ x 104⅝ in.
Firebox plates, thickness	⅜ in.
Firebox, water space	F., 4½ in.; S. & B., 3½ in.
Tubes, number and outside diameter	234—2 in.
Flues, number and outside diameter	32—5⅜ in.
Tubes, length	21 ft.
Heating surface, tubes	3,519 sq. ft.
Heating surface, firebox	225 sq. ft.
Heating surface, total, evaporating	3,744 sq. ft.
Superheater heating surface	812 sq. ft.
Total equivalent heating surface*	4,962 sq. ft.
Grate area	87 sq. ft.
Smoke stack height above rail	14 ft. 6⅝ in.

Tender.

Frame	13 in. channel
Wheels, diameter	36 in.
Journals, diameter and length	5½ in. x 10 in.
Water capacity	7,000 gallons.
Coal capacity	12 tons

* Equivalent heating surface = evaporative heating surface + 1½ times superheater heating surface.

RAILROAD WORK A HEALTHFUL OCCUPATION

The Bureau of Railway News and Statistics has issued a bulletin to show that railway employees follow a calling more healthful than almost any other, according to figures compiled from the United States census and compared with showings from foreign countries. "The occupation of the railroad man, not only in the United States, but evidently the world over," the bureau says, "is shown to be among those most directly conducive to health, while the expectation of life for the railway employee is higher by a wide margin than that of the average person who works for a living.

"Figures for the United States covering 27 industries show that for every 1,000 employees engaged there is a yearly mortality of about 15, varying from 23.8 in the case of coopers and 26.6 among flour and grist mill workers, to only 9.1 among plumbers, gas and steam fitters.

"How low in this scale of mortality the railroad man stands is shown by the fact that steam railway employees report only 10.8 deaths per 1,000, compared with 15 for all classes. Most significant in the showing for railway men is the scarcity of deaths due to bodily infirmities, for while deaths due to accidents are higher than in any of the other occupations reporting, mortality due to tuberculosis, pneumonia, heart disease and diseases of the nervous system is so far below that for almost any other calling that the total deaths per 1,000 are held down to more than 4 less than the average for the 27 occupations.

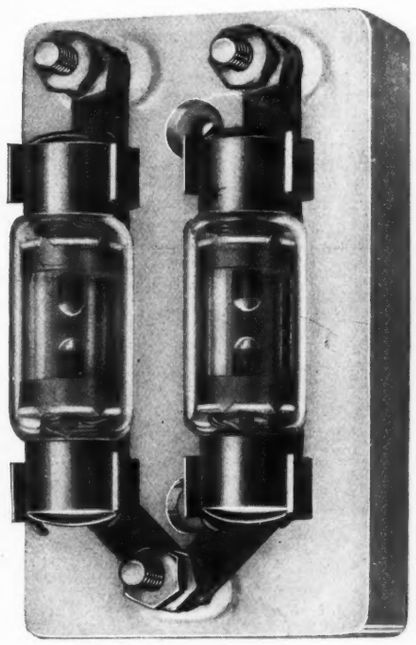
"That the outdoor activity of railway employees is beneficial abroad as well as here is shown by figures which are available for several foreign countries. In France, for instance, while the occupational death rate averages 8 per 1,000 between the ages of 25 and 34; 11.2 from 35 to 44 and 17.8 from 45 to 54 the railway death rate at the same ages is only 6.6, 8.7 and 13.1 per 1,000 respectively. In Switzerland, as in America, the railway man's liability to accident, as might be expected, is above the average, according to available figures, yet even with this disadvantage the total death rate is considerably below the average. Tuberculosis especially claims far fewer victims, the average death rate per 100,000 between the ages of 20 and 29 from this cause being 304 against only 150 for railway men.

"In Great Britain not only is the railway man's death rate below the average, but the inferior mortality grows more striking with advancing age. The general death rate among wage earners is 6.4 per 1,000 between 25 and 34 against the railway's 4.8. Between 45 and 54 years this margin of longevity for railway men has been extended to the difference between 18.7 for wage earners in general and 13.8 for railway men. It is striking that in Great Britain the death rate among enginemen is not only lower than the railway average, but much lower than the figure for working men as a whole. Of all workers 10.9 of every 1,000 died between the ages 35 and 44 against only 5.6 among enginemen and firemen."

THE BRACH LIGHTNING ARRESTER

The illustration printed herewith shows a new vacuum lightning arrester, which is giving satisfactory service on telephone, telegraph and signal wires. It is called by the maker the "F. D. Type." It has its main element built like a fuse cartridge. Two metal electrodes are held fixed ¼ in. apart by porcelain spool heads wrapped with several layers of transparent mica. The entire spool is sealed in a glass tube through which the electrodes are connected by platinum wire. The tube is exhausted of air to a degree that permits the electrodes to shunt one one-thousandth of an inch in air. The arresters are tested by a static machine which is connected to two metals in air adjusted at 1-1000 in., and the circuit put in multiple with the arrester that is being exhausted. As soon as the visible arc appears in the arrester and disappears from the air gap, the arrester is sealed and capped.

It is then tested on a direct current machine; and to be classed as good for telephone service, it must discharge the circuit under 475 volts. As the electrodes themselves are ¼ in. apart it will be seen that permanent grounding is impossible. An arrester so delicately adjusted affords protection not only against lightning, but also against induced currents from high voltage lines. The cost of maintenance of the cartridges is very low. This arrester gives evidence of its operation, for whenever a discharge passes through the instrument it lights up with a luminous glow. Each base is adapted for one individual circuit, but means are provided for grouping several units together, the ground terminal having a hook to connect to the adjoining unit. The size of the base is 5⅜ in. x 3⅛ in. x ¾ in. The design of the vacuum tube facilitates handling, installing and testing. The ground terminals are separated 4½ in. from the line terminals, to eliminate any possibility of grounding through



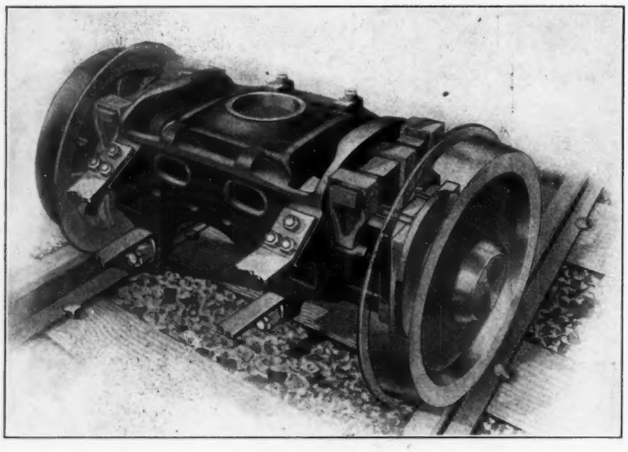
Brach's Lightning Arrester

loosened wires. There are no exposed seal-off tips from the glass and the cartridges may be carried in pocket or kit. Vibration will not affect the arrester, the cartridge being held in a spring support.

This arrester is made by the L. S. Brach Supply Company, 143 Liberty street, New York. An interesting booklet has been issued describing these arresters.

ECONOMY ENGINE TRUCK

An improvement in engine truck design, adaptable to either the two or four-wheel types, has been developed by the Economy Devices Corporation, 30 Church street, New York. It employs a new type of centering arrangement, and also a new form for the truck frame and pedestal. The development of this truck was inspired by the knowledge that the very large locomotives with wheel bases of about 34 ft. have so great a bolster displacement at the front truck that the usual designs are unsatisfactory both in guiding qualities and in preventing flange wear on the drivers. This is true because a bolster displacement of as much as 4½ in. is frequently required for this length of wheel base and the three point hangers generally used must have an excessive length in proportion to the spread of the hanger pins, thereby reducing the initial resistance of the bolster, to the impairment of the guiding qualities. The evidence of this is seen in the greatly increased wear on the driving wheel flanges of these long locomotives. This form of truck is shown in the upper part of the drawing and the design that has now been developed is shown below it. The latter is called a "constant resistance" centering arrangement and the bolster rests on the points of rockers of the form shown. Upon the displacement of the center pin in either direction the contact point moves on the curved surface of the rockers and the inclined plane to the bolster and thus maintains



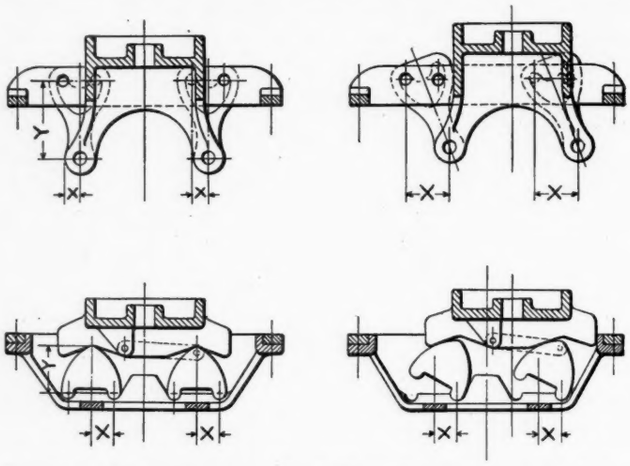
General View of the Economy Locomotive Front Truck

a practically constant ratio between X and Y, or a constant lateral resistance. It will be seen that this ratio in the three point hangers, shown above, increases very rapidly as the center pin is displaced laterally.

At the point of greatest displacement, which occurs when the locomotive is going around sharp curves or turnouts, especially on the light tracks usually found in engine terminals, the diminished resistance offered by this new type of support is particularly appreciated. Furthermore, the increased guiding effort on a truck on a tangent, or on curves found on the main line, which results from the larger ratio of X to Y that can be obtained in the central position, should have a striking effect in diminished wear of driving wheel flanges.

The frame and pedestals of the truck are cast in one piece and are so arranged that semi-elliptic springs of a good length may be used while still affording ample clearance under the locomotive frame. The springs are supported by hangers directly from the main frame. Advantage has been taken in this design to so locate the pedestal tie bars that they come inside the journal boxes, thus making provision for journal box cellars of a depth suitable to insure proper lubrication. The arrangement also facilitates the removal and replacement of cellars while packing.

The pedestals have been provided with pressed steel shoes of a special design, held in position by vertical flanges on the sides and with lips turned over the top and bottom. These



The Upper Views Show the Usual Three Point Hangers, and the Lower the Economy Arrangement for Engine Trucks

can be quickly replaced when worn without dropping the wheels. The design further includes cast iron axle collars secured to the axle inside of the journal boxes. These reduce hub wear and materially decrease the cost of maintenance.

THE WORKSHOPS OF THE SOUTH MANCHURIA RAILWAY.—The South Manchuria Railway has shops at Shahokou, a few miles from Dairen, representing, with their equipment, an outlay of about $3,000,000. These shops are quite new. The first consignment of building material and machinery arrived from abroad in 1910, and the work of construction and installation was completed as recently as in November of the following year. The building material and machinery were mainly imported from Great Britain. Most of the rolling stock of the railway, on the other hand, was purchased in this country, and all of it was built to conform to American designs. The United States also supplied much of the tool equipment and some of the building material and machinery. The area of the workshops and the residential colony about them is about 400 acres. The residential section occupies about half the total area, and contains 696 houses for the staff and laborers, 12 houses for trades people, a hospital, a primary school, a post office and telegraph office, three small public baths and a club house. The district is equipped with water supply and drainage systems. All of the houses are lighted by electricity, and in the better class of houses there are hot water heating systems. The population consists of about 2,600 Japanese and 1,000 Chinese. The shop buildings alone cover nearly 11 acres. They are so placed as to be afforded good natural light and are well grouped. They are fitted throughout with modern appliances, and at any one time can take care of 27 locomotives, 36 passenger cars and 130 freight cars. The plant is very complete, for it includes: locomotive and machine shops; boiler shops; a blacksmith shop; a foundry; a pattern shop and foundry stores; a power house; general stores; a truck, wheel and brake shop; a wood mill and freight car shop; a cabinet, upholstering and passenger car shop; a paint shop; a timber storeroom; a timber drying kiln; a train lighting equipment shop; testing laboratories; a fire station; a pumping station; a 70-ft. turntable; a 75-ft. traverse, and a general office building.

General News Department

On the Delaware, Lackawanna & Western in 1913, the weight of mails carried exceeded by 23 per cent. the quantity carried in 1912, while the increase in compensation received was only 6.19 per cent.

Sidney Buxton, president of the British Board of Trade, has been promoted to the position of governor general of the Union of South Africa; and the new president of the board of trade is John Burns, promoted from the position of president of the Local Government Board.

At the recent convention of the Wood Preservers' Association at New Orleans, it was decided to issue a quarterly bulletin giving information regarding the members and the news of interest to the association. This bulletin is issued by the secretary at Baltimore and the first number has just been received from the press.

In a storm which prevailed in North Carolina, February 25 and 26, more than a foot of snow fell, an almost unprecedented fall for that region; and railroad traffic in many places was almost paralyzed. At one time, seven passenger trains of the Atlantic Coast Line were stalled at Fayetteville, N. C. In the same storm, trains of the Illinois Traction System and the Wabash were held in snowdrifts near Decatur, 36 hours.

The number of passenger trains which were discontinued by the Pennsylvania, last week, is said to be 25, including the changes both east and west of Pittsburgh. The principal through trains taken off are the Panhandle Limited, Chicago to New York, the same train westward, and the Pittsburgh day express, leaving New York in the morning. It is reported that the New Haven road will take off a considerable number of short distance passenger trains March 15.

On the Pennsylvania Railroad System last year the trespassers killed numbered 497 or 34 more than in 1912. Practically half of those killed in 1913 while trespassing were useful citizens; only 250 of them were unidentified, or classed as tramps. Among the trespassers were farmers, bakers, a preacher, glass workers, carpenters, coachmen, a doctor, fishermen, laborers, mill workers, a soldier, a sailor, a stone mason, miners, shoe makers, teamsters, a student, Indians, a fireman, coke drawer, boys and employees of other railroads. Twelve of the victims were women.

H. C. Nutt, chairman of the central safety and efficiency committee of the San Pedro, Los Angeles & Salt Lake, announces a 50 per cent. reduction in the number of personal injuries to employees in January as compared with December, and also a reduction of over 50 per cent. in the number of train accidents during January as compared with December. The safety first movement was started on this road on November 1. During the month of November there were 75 personal injuries to employees, in December 68 and in January only 34. Only one-half of the 34 were serious enough to be reported by telegraph.

Growth of Sanitation on Chicago & North Western

Somewhat over a year ago the Chicago & North Western established a systematic plan of sanitary inspection on its lines under the supervision of Dr. C. G. Elmore. At the start Dr. Elmore confined his efforts to cars arriving at and leaving from the new passenger terminal in Chicago. He has so rapidly enlarged his field, however, that today the Chicago passenger terminal itself, as well as all parlor cars, buffet cars, dining cars, chair cars, coaches, baggage cars, stations and employees' quarters at such places as roundhouses, shops, etc., over the entire system come under his direct supervision. Three hundred and twenty-five cars are cleaned and inspected at the California avenue yards in Chicago each day, and about 250 at the Erie street yards.

Dr. Elmore is having especial care exercised in connection with a number of seemingly small details. For example, the corners of window sills are given extra cleansing and disinfecting. Blinds in lavatories are being discarded for the more sanitary glazed windows. Each lavatory must be provided with ample ventilation. Dining cars are inspected while on their regular runs for the refrigeration of milk and vegetables and for the handling of butter, cheese, etc. Fish racks in baggage cars, are kept thoroughly clean and fresh with cleanser and deodorant. Milk loading stations are watched to see that no milk remains on the platform to attract flies or other germ-carrying insects. At the principal coach yards a card system has been installed by which a car inspector can tell at a glance whether or not the cleaning has been done seasonably, and if after inspection he finds any part of the work unsatisfactory, can tell who is responsible and have that employee go over his share of the work, thus insuring maximum cleanliness of cars before they go into service.

Three Passengers Killed by Robbers

On a passenger train of the Great Northern Railway at Samish, Wash., on the night of February 20, train robbers going through a car shot and killed three passengers who resisted them. The robbers had boarded the train at a station. After a short time, they went from the smoking car to the day coach, tying handkerchiefs over their faces when they passed from one car to the other. One of the robbers, who guarded the door, was pounced upon by the three passengers, but he succeeded in shooting them. Another robber extinguished the lights in the car with his pistol. The bell cord having been pulled, the train slackened speed and the robbers got off and escaped. The railroad company offered a reward of $10,000 for each of the three robbers.

Disastrous Storm at New York

A storm of rain, snow and wind which began in New Jersey and southeastern New York on Sunday last and continued about 24 hours, caused an almost complete suspension of traffic on a half dozen important railroads for a night and a day, delaying many thousands of passengers, and holding back nearly all freight traffic on the lines affected for three or four days. Telegraphs and telephones were put out of business almost completely. This condition prevailed throughout the railway lines within a radius of 50 to 75 miles of New York, except on the north and northeast, and to less extent farther away.

Rain began falling Sunday morning. From noon it was accompanied by snow, two storms having come on at the same time, and by Monday morning there was in New York City 10 inches of snow, the lower stratum of which was heavy with water; while the upper surface was considerably frozen. The most serious trouble on the railways was the destruction of telegraph lines. Poles carrying scores of wires were broken off; some near the top, cutting off communication, and others near the bottom. The latter fell on the tracks at innumerable places, necessitating many hours of work by large forces of men to permit the movement of trains. The stoppage of trains by this cause allowed snow drifts to accumulate, in those regions where the snow was dry enough to be drifted by wind.

This storm had been preceded two weeks before by 16 inches of snow, an unusually heavy fall for this latitude, so that electric railway and street traffic, were very badly hampered in New York, and less severely in the smaller cities.

Telegraph lines were more completely demoralized than before since the great storm of 1888, and for about 36 hours there was no wire communication between New York and Washington, except over the underground cable of the American Telephone & Telegraph Company. This cable line, carrying 96 circuits (192 wires), under construction for many months past, had been only recently completed. Between New York and Philadelphia one circuit of the cable was secured by the Pennsylvania Railroad and one by the Western Union Telegraph Company. All the rest seem to have been reserved, at least during the day, for regular users, holders of leases. There was sufficient damage to wires in Central New York and other regions

so that between New York and Chicago there was no direct telegraphic communication for about 48 hours.

The Lackawanna road made good use of its wireless telegraph.

From the very unsatisfactory despatches the following partial statements of details are made up:

CENTRAL OF NEW JERSEY

The storm completely destroyed the telegraph lines on both sides of the track as far west as Bound Brook. A piece of wire, coated with ice, 2 ft. long, which was weighed just as it fell, was found to weigh 7¼ lb. On this part of the road the snow would have given no trouble whatever, but the telegraph poles, falling across the main tracks, with their tangled mass of wires, stopped all westbound traffic between Jersey City and Bound Brook until about 7 o'clock Monday morning. Eastbound, one track was open all the time, and service was not interrupted.

West of Somerville there were snow banks 8 ft. to 12 ft. deep in spots, but the plow opened the road westbound before noon Monday, and through passenger service between Mauch Chunk and Jersey City was in operation by Monday noon.

Service between Philadelphia and New York was interrupted from 9 o'clock Sunday night until 3 o'clock Monday afternoon eastbound, and till 12 o'clock noon Tuesday, westbound; but trains were moved to and from Philadelphia via Allentown and Reading.

Up to Wednesday noon no telegraph wires had been restored at any point in New Jersey, except a short stretch between Phillipsburg and Bloomsbury. The automatic block signals were working, all right; but on other sections of the road trains were kept moving by observing tower signals, hand signals being given indicating condition of track ahead so far as towerman could get information by reason of trains which had passed him.

Freight service was resumed Tuesday afternoon.

A full suburban service schedule was in operation Tuesday morning, and continued in full operation, constantly improving, all day. Full suburban service, practically on time, was restored Wednesday morning.

At no time were the suburban trains on this road completely out of business. Even on Monday morning a number of trains made their way into Jersey City, and by Monday afternoon a very considerable service was maintained as far as Somerville.

PENNSYLVANIA RAILROAD

On the New York division of the Pennsylvania, all wires were out of commission for three days or more, about 200 poles having been broken off at various points between New York and Trenton. The poles and wires fell on the tracks at many places. Innumerable poles were bent over so as to put the wires out of service. All four of the tracks were obstructed at many places. The destruction of the wire lines put the automatic block signals out of order in many places. Deep snow blocked trains at many places as far south as Bristol, Pa., 23 miles north of Philadelphia.

No train left the Pennsylvania station in New York from 7 o'clock Sunday evening until 8:30 Monday evening, 25½ hours. A number of eastbound passenger trains of Sunday afternoon and evening were stalled and did not reach New York until noon on Monday. Many passengers were kept at hotels in Trenton for 24 hours.

There were no serious blockades west of Philadelphia, and there was not much trouble from the storm south of Philadelphia. All divisions in New Jersey were blocked. Normal passenger traffic was not resumed on the Trenton division until Wednesday morning. The West Jersey & Seashore kept the most of its passenger trains moving.

By Wednesday morning, trains were moving on all four main tracks between New York and Philadelphia. Some perishable freight had been moved the night before, and also a few ordinary trains.

The Pennsylvania lost not only its telegraph lines between New York and Philadelphia, but also its long distance telephone line. The company secured the use of one circuit in the underground telephone cable owned by the American Telephone and Telegraph Company, and thus was able to keep up communication between the general offices and the division terminals.

NEW YORK CENTRAL & HUDSON RIVER

The electric division, New York to Croton, was kept open and trains ran with fair regularity. On this section of the road, the wires of the automatic block signal system are carried on steel poles or towers. North of Peekskill, northbound trains were delayed for many hours Sunday night by fallen telegraph poles. Telegraphic communication was badly crippled, but one or more wires were kept in service between New York and Albany by indirect routes. West of Albany, there was much delay from snow, but no such serious troubles were encountered as in the region of New York. The Harlem division, which is electrified from New York to White Plains, was kept open, and trains were run with fair regularity.

NEW YORK, NEW HAVEN & HARTFORD

On this road, trains were run with a very satisfactory degree of regularity. No trains were annulled and delays to the suburban service did not average more than five minutes. From New York to Stamford, the line is electrified and all wires are carried on steel supports. East of Stamford the storm was not so severe, though in western Massachusetts it took the form of sleet.

ERIE RAILROAD

Broken telegraph poles blocked all of this company's lines for 90 miles out of Jersey City. No through trains were run on Monday. The suburban service was operated on a curtailed schedule.

West of Suffern heavy snow blocked all trains, drifts being encountered at many places. Through passenger trains were delayed 24 hours or more, none being run with regularity until Tuesday afternoon. On the Northern Railroad of New Jersey there was only slight interruption, principally due to wire failures. On the New York, Susquehanna & Western the service was badly demoralized west of Paterson.

Automatic block signals were out of commission on the main line between Jersey City and Port Jervis until Tuesday morning.

Passenger traffic was resumed with fair regularity on the main line Tuesday evening, with the exception of 10 or 12 suburban trains which were annulled without seriously interfering with the movement of passengers. Telegraphic communication was restored very slowly and was very deficient as late as Thursday.

LEHIGH VALLEY

The Lehigh Valley suffered mainly from deep snow in western New Jersey and eastern Pennsylvania. Many telegraph poles were broken and telegraphic communication was entirely suspended from Sunday night until Monday afternoon between New York and that part of the line west of Easton, Pa. Beyond Easton there was practically no delay. Several through passenger trains were annulled Monday because of the storm, and some others were combined, but passenger and milk trains generally were kept moving. Freight traffic was held up Monday, but stock and perishable freight was got into Jersey City by Tuesday afternoon.

LONG ISLAND

On this road the snow was very heavy and badly drifted, and many telegraph poles and wires were down. Several trains Sunday night did not reach their destination. Several derailments and accidents added to the difficulties. On Monday morning all of the electrically operated branches were blocked until about 10 o'clock a. m., when trains began to move between Jamaica and Brooklyn and the Pennsylvania station, New York. The Whitestone branch was open a little earlier. The Port Washington branch was not open until noon. Far Rockaway and Rockaway Beach were relieved in the early afternoon. By 4 o'clock an intermittent service was operated to all points, and by 10 a. m., Tuesday, everything was normal; and freight trains were sent out.

DELAWARE, LACKAWANNA & WESTERN

This road was troubled mainly by deep snow as far west as Binghamton, but suburban trains to and from New York were run with fair regularity. Through passenger trains stalled near the Delaware river Sunday night were pulled out Monday afternoon. Telegraph wires were badly crippled by reason of the breakage of poles and wires due to the heavy sleet, but the company made good use of its wireless telegraph, as noted below. Perishable freight in trains which were stalled Sunday night was brought into New York on Tuesday night and Wednesday. Ordinary freight was practically all held up until Wednesday, but by Wednesday night operation of all trains was practically normal. In the region of Pocono mountain snow 10 ft. deep and deeper was continuous for 70 to 100 rods in a number of places.

THE WIRELESS TELEGRAPH

By means of its wireless telegraph, which now is in condition to transmit messages 150 miles, the Delaware, Lackawanna & Western was able to send communications to the principal points east of Binghamton without interruption; and the officers of the road were able to give some assistance to the Erie and the Central of New Jersey. The receiving apparatus at the New York end of the line was not ready for operation, but messages were received at the office of the Marconi wireless telegraph in the Wanamaker building at 10th street and then telephoned from there to the office of the road. As heretofore noted in the *Railway Age Gazette*, this railroad company some weeks ago ordered the extension of its wireless system by the construction of stations at Port Morris, about midway between Hoboken and Scranton, and at Bath, about midway between Binghamton and Buffalo. The officers are now considering the extension of the system throughout the length of the road to Buffalo.

On Monday, Monday night and Tuesday, General Superintendent Rine, at Scranton, sent frequent reports by wireless to President Truesdale in New York.

New Freight House at Chattanooga

The Southern Railway has recently spent $125,000 in the enlargement of its freight facilities at Chattanooga, Tenn., and this terminal now has facilities for loading and unloading 100 cars of merchandise daily, besides space on team tracks for 50 cars.

The outbound freight shed is an entirely new building and the old structure is used wholly for inbound freight. The new building is 34 feet wide by 250 feet long. It has a frame of steel, but there are no side walls, the only enclosures being rooms for the clerks and a small room for securing freight which must be kept a short time. The foundation consists of concrete walls 24 inches thick and the floor is of granulitic concrete 6 inches thick. The roof is of concrete, covered with composition. There are two transfer platforms, covered, 14 feet wide, one being 528 feet long and the other 517 feet. In the team track yard there is a 15-ton hand power pillar crane. There is an automobile platform 16 feet wide and 80 feet long. Between the tracks in the yard there has been laid terra cotta drain pipe 6 inches in diameter, with open joints, the joints being surrounded with cinders.

Program of the American Railway Engineering Association Convention

The fifteenth annual convention of the American Railway Engineering Association will be held at the Congress hotel, Chicago, March 17-20. Sessions will convene at 9:30 a. m. and 2 p. m. each day. The following is the program:

Tuesday, March 17—
- President's address.
- Reports of the secretary and treasurer.
- Reports of standing and special committees as follows:

Committee No. 12—Rules and organization	Bulletin No. 162
Committee No. 10—Signals and Interlocking	Bulletin No. 162
Committee No. 14—Yards and terminals	Bulletin No. 162
Committee No. 1—Roadway	Bulletin No. 162
Committee No. 7—Wooden bridges and trestles	Bulletin No. 162
Committee No. 15—Iron and steel structures	Bulletin No. 163

Wednesday, March 18—

Committee No. 8—Masonry	Bulletin No. 163
Committee No. 5—Track	Bulletin No. 163
Committee No. 18—Electricity	Bulletin No. 163
Committee No. 17—Wood preservation	Bulletin No. 163
Special committee—Grading of lumber	Bulletin No. 163
Committee No. 13—Water service	Bulletin No. 163
Committee No. 6—Buildings	Bulletin No. 163
Committee No. 4—Rail	Bulletin No. 164

- Annual dinner at 7 p. m.

Thursday, March 19—

Committee No. 3—Ties	Bulletin No. 164
Committee No. 9—Signs, fences and crossings	Bulletin No. 164
Committee No. 19—Conservation of natural resources	Bulletin No. 164
Committee No. 16—Economics of railway location	Bulletin No. 164
Special committee—Uniform general contract forms	Bulletin No. 164
Committee No. 11—Records and accounts	Bulletin No. 164
Committee No. 2—Ballast	Bulletin No. 164

- New business.
- Election and installation of officers.
- Adjournment.

Friday, March 20—
- Visit to the exhibit of the National Railway Appliances Association at the Coliseum.

Railway Signal Association

The regular meeting of this association will be held at the Congress hotel, Chicago, March 16, with sessions at 9:30 a. m. and 2:30 p. m. Reports will be presented by the committees on signal practice; on automatic block signals; on the manual block system; standard designs; definitions; storage batteries; method of recording signal performance; signaling requirements of electric railways, and signaling in the Southwest. Among the subjects dealt with in these reports are the following: Tests of creosote used in treating cross ties; tests of treated ties; economics of labor in signal maintenance; specifications for wood pole line brackets; specifications for caustic soda primary batteries; specifications for copper sulphate; changes in A. R. A. rules for signalmen and trainmen; seven drawings of standards for storage batteries; signal report blanks; and drawings of proposed standards for various parts of interlocking, including two that will supersede existing standards; also standard drawings for a train-order signal and the details and assembly of marker lights.

American Society of Mechanical Engineers

At a meeting to be held under the auspices of the New York members of the American Society of Mechanical Engineers, the American Institute of Mining Engineers and the American Electrochemical Society at 29 West Thirty-ninth street, New York, on Tuesday, March 10, papers will be read on the subject of Color Photography, Its Processes and Results. The speakers are F. E. Ives, who originated the tripak and trichrome, system of color photography; Westley Allison, representing the Lumiere Jougla process and John Powrie, the originator of the Warner-Powrie process.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 5-8, Hotel Pontchartrain, Detroit, Mich.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Karpen Building, Chicago. June 15-17, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga. Next convention, July 20-22, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 30 to July 4, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. June 16-19, St. Paul-Minneapolis, Minn.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 19-21, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, Highland Park, Ill. Annual meeting, June 24, Minneapolis, Minn.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St, Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

Civil Engineers' Society of St. Paul.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—E. H. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Richmond, Va. Next convention, May 13, Hotel Galvez, Galveston, Tex.

General Superintendents' Association of Chicago.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

International Railway Congress.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

International Railway Fuel Association.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 14-17, Hotel Sherman, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

Maintenance of Way & Master Painters' Association of the United States and Canada.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York. Next annual meeting, May 26-29, Hotel Waldron, Philadelphia.

Master Car Builders' Association.—J. W. Taylor, Karpen building, Chicago. June 10-12, Atlantic City, N. J.

Master Car & Locomotive Painters' Assoc. of U. S. and Canada.—A. P. Dane, B. & M., Reading, Mass. Next convention, September 8-11, Nashville, Tenn.

National Railway Appliance Assoc.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

Northern Railroad Club.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York.

Railway Club of Pittsburgh.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

Railway Fire Protection Association.—C. B. Edwards, Mobile & Ohio, Mobile, Ala.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.

Railway Development Association.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa. Chicago, March 16; New York, June 9. Annual meeting, Bluff Point, N. Y., September 22.

Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio. Next convention, May 18-20, Hotel Raleigh, Washington, D. C.

Railway Supply Manufacturers' Assoc.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

Railway Tel. & Tel. Appliance Assoc.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

Richmond Railroad Club.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, 519 Boston building, Salt Lake City, Utah; 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

Society of Railway Financial Officers.—C. Nyquist, La Salle St. Station, Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

Toledo Transportation Club.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

Traffic Club of St. Louis.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

Transportation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transportation Club of Detroit.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, August, Chicago.

Utah Society of Engineers.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3d Friday of each month, except July and August.

Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, Karpen building, Chicago; 3d Tuesday of each month, except June, July and August.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News

The Chicago, Burlington & Quincy now runs sleeping cars between Minneapolis, Minn., and Peoria, Ill.

The legislature of South Carolina has before it a bill to limit passenger fares throughout the state to a rate of 2 cents a mile. It is charged that Senator Tillman and Governor Blease are responsible for the agitation of this matter.

The Missouri, Kansas & Texas is running an agricultural special over its Texas lines, leaving Houston, March 5, and completing its rounds at Waco, April 3. It will make 120 stops. The train will be run in co-operation with the Texas Agricultural & Mechanical College and the College of Industrial Arts. The train will traverse the lines of the Missouri, Kansas & Texas, the Texas Central, the Wichita Falls & Northwestern, the Wichita Falls & Southern and the Wichita Falls Railway.

The Louisville & Nashville announces that it will reduce passenger fares throughout Kentucky to the basis of 2½ cents a mile; and it is said that this rate is to be generally adopted on April 1 in Tennessee and Alabama. This result, ending long pending litigation is the fruit of conferences recently held between representatives of the Tennessee Railroad Commission, the Louisville & Nashville, and the Nashville, Chattanooga & St. Louis Railways; and by Governor O'Neal of Alabama, the Railroad Commission, the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Western of Alabama, and the Central of Georgia.

At a meeting of representatives of various commercial organizations in the Mississippi valley, held on February 24 in the offices of the Illinois Manufacturers' Association, at Chicago, resolutions protesting against the proposed charge for spotting cars were adopted as follows:

"Resolved, That the representatives of the associations oppose the proposal to permit the carriers to impose an extra charge for the so-called spotting of cars for the following reasons:

"First—That this service is a part of transportation service.

"Second—That it is already included in the rate.

"Third—That the spotting service as defined at the hearings of the commission is not actually performed except in a very small percentage of deliveries.

"Fourth—That if the spotting of cars is not a part of the transportation service it is a local service and the question of an imposition of any charge therefor is for the state commissions and not for the Interstate Commerce Commission."

Congressional Report on Regulation of Ocean Traffic

The committee on Merchant Marine and Fisheries of the lower house of Congress has made a report on the regulation of interstate commerce by coastwise steamers and of foreign commerce by water, in which the propriety of pooling agreements between steamship companies is recognized. Such agreements, like those between the transatlantic steamship lines, should be recognized, provided they are brought under effective government supervision, and the committee recommends that supervision be put in the hands of the Interstate Commerce Commission.

The report says:

"Open competition cannot be assured for any length of time by ordering existing agreements terminated. Such terminating would either cause the lines to engage in rate wars, which would inevitably result in the survival of the fittest; or, to avoid a costly struggle, they would consolidate through common ownership. In the foreign trade it is the almost universal practice for steamship lines both on the inbound and outbound voyage to operate under agreements and conferences. With reference to the domestic trade the facts show that competition in rates between steamship lines has been as effectively eliminated, as in the foreign trade."

The recommendations of the committee for legislation concerning foreign commerce include the following:

That all agreements between navigation companies or between such companies and railroads or shippers be filed with

the Interstate Commerce Commission for approval or disapproval.

That the commission be empowered to investigate complaints, with power to order rates changed. That rebating in all its forms be prohibited.

In domestic trade, in addition to the foregoing, the jurisdiction of the Interstate Commerce Commission should include full power to regulate rates and determine maximum charges; and water carriers, if cutting rates to drive out a competitor, should be denied the privilege of restoring rates.

That all traffic associations or conferences, whether pertaining to through rail and water transportation or to port to port traffic only, be brought under the supervision of the commission.

Further, the committee would have the railroads and water carriers issue through bills of lading for shipments delivered to all interstate water carriers that provide reasonable quality and regularity of service; would require railroads to make their terminal facilities available to water carriers and would have all interstate traffic on canals placed under the supervision of the Interstate Commerce Commission.

Car Surpluses and Shortages

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association, in presenting statistical bulletin No. 161-A, giving a summary of car surpluses and shortages by groups from October 24, 1912, to February 14, 1914, says: The total surplus on February 14, 1914, was 199,385 cars; on February 1, 1914, 211,960 cars, and on February 15, 1913, 52,700 cars.

Compared with the preceding period; there is a decrease of 11,575 cars, of which 9,469 is in box, 1,415 in flat, 714 in coal and gondola and 977 in miscellaneous car surplus. The decrease in box car surplus is in groups 1 (New England Lines); 3 (Ohio, Indiana, Michigan and Western Pennsylvania); 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida); 6 (Iowa, Illinois, Wisconsin and Minnesota); 7 (Montana, Wyoming and the Dakotas); 10 (Washington, Oregon, Idaho, California, Nevada and Arizona) and 11 (Canadian Lines). The decrease in flat car surplus is in groups 2 (New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania), 5, 7, 10 and 11 (as above); 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas) and 9 (Texas, Louisiana and Mexico). The decrease in coal and gondola car surplus is in groups 3, 5, 8, 9 and 10 (as above). The decrease in miscellaneous car surplus is in groups 2, 4 and 5 (as above).

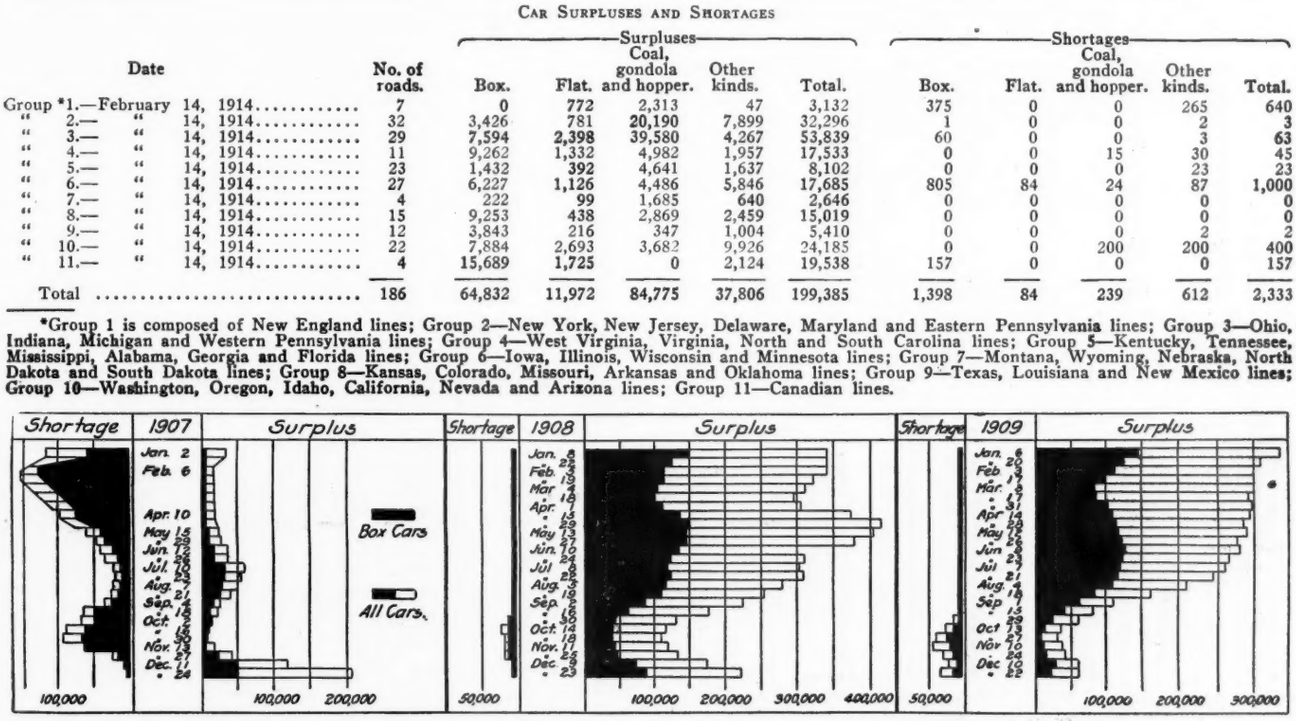
The total shortage on February 14, 1914, was 2,333 cars; on February 1, 1914, 2,282 cars, and on February 15, 1913, 30,517.

Compared with the preceding period; there is an increase of 51 cars, of which 11 is in box, 137 in coal and gondola, 129 in

CAR SURPLUSES AND SHORTAGES

Date	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—February 14, 1914	7	0	772	2,313	47	3,132	375	0	0	265	640
" 2.— " 14, 1914	32	3,426	781	20,190	7,899	32,296	1	0	0	2	3
" 3.— " 14, 1914	29	7,594	2,398	39,580	4,267	53,839	60	0	0	3	63
" 4.— " 14, 1914	11	9,262	1,332	4,982	1,957	17,533	0	0	15	30	45
" 5.— " 14, 1914	23	1,432	392	4,641	1,637	8,102	0	0	0	23	23
" 6.— " 14, 1914	27	6,227	1,126	4,486	5,846	17,685	805	84	24	87	1,000
" 7.— " 14, 1914	4	222	99	1,685	640	2,646	0	0	0	0	0
" 8.— " 14, 1914	15	9,253	438	2,869	2,459	15,019	0	0	0	0	0
" 9.— " 14, 1914	12	3,843	216	347	1,004	5,410	0	0	0	2	2
" 10.— " 14, 1914	22	7,884	2,693	3,682	9,926	24,185	0	0	200	200	400
" 11.— " 14, 1914	4	15,689	1,725	0	2,124	19,538	157	0	0	0	157
Total	186	64,832	11,972	84,775	37,806	199,385	1,398	84	239	612	2,333

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages, 1907 to 1914

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER, 1913.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total. inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	142	$107,652	$54,833	$174,009	$27,416	$34,405	$3,928	$60,273	$5,793	$131,817	$42,192	—$271	$12,298	$29,628	—$17,163
Alabama Great Southern	309	334,063	132,085	506,369	59,158	121,721	13,925	165,011	10,421	370,238	136,131	—1,177	16,875	118,078	—8,592
Ann Arbor	291	135,904	46,254	194,257	21,594	25,643	5,369	71,712	7,276	131,596	62,661	—47	13,600	49,014	3,356
Arizona & New Mexico	108	61,695	9,307	74,335	11,179	11,380	775	15,881	2,963	42,180	32,154	.....	1,383	30,771	—14,041
Arizona Eastern	366	181,221	36,783	231,609	11,296	27,475	1,866	66,665	9,439	116,743	114,365	—81	19,808	94,976	—10,366
Atchison, Topeka & Santa Fe	8,340	4,907,028	2,122,782	7,696,530	998,217	1,390,766	198,948	2,340,969	199,435	5,128,336	2,568,194	.....	443,638	2,124,556	—416,692
Atlanta & West Point	92	55,187	45,068	115,227	13,111	24,624	4,976	33,696	4,848	81,257	33,969	202	8,051	26,120	—2,588
Atlanta, Birmingham & Atlantic	645	236,853	75,612	339,812	54,806	48,217	13,624	123,509	10,786	250,944	88,868	.....	14,336	74,531	25,945
Atlantic & St. Lawrence	166	94,399	33,362	143,302	18,717	29,291	4,664	81,683	5,724	140,081	3,221	.....	10,157	—6,935	—57,546
Atlantic City	166	58,218	51,718	117,635	56,512	10,129	1,142	78,485	782	147,052	—29,417	—2,037	9,000	—40,454	15,024
Atlantic Coast Line	4,629	2,432,268	925,806	3,630,478	396,411	488,227	56,243	1,142,389	98,661	2,181,932	1,448,545	—3,260	132,000	1,313,284	8,459
Baltimore & Ohio	4,456	6,073,184	1,323,507	7,909,925	863,417	1,239,905	152,352	3,345,297	201,840	5,802,813	2,107,112	—88,862	299,740	1,718,508	—268,836
Baltimore & Ohio Chicago Terminal	77	544	116,724	128,320	11,343	28,268	666	63,299	5,191	108,768	19,552	717	20,168	101	9,224
Bangor & Aroostook	630	226,892	54,566	296,683	37,686	41,410	3,034	108,419	8,849	199,400	97,283	—506	10,832	85,944	—173
Belt Ry. Co. of Chicago	21	.....	.....	244,170	22,914	23,959	677	112,473	7,840	167,867	76,302	.....	9,611	66,691	—29,339
Bessemer & Lake Erie	203	423,109	30,215	465,913	55,895	269,738	11,584	160,542	32,334	530,095	—64,182	.....	38,000	—102,182	—134,517
Bingham & Garfield	26	135,882	4,398	140,928	13,652	16,705	1,101	21,666	1,718	54,843	86,084	.....	3,165	82,918	38,708
Birmingham Southern	44	57,008	969	96,008	17,043	13,790	536	33,332	6,903	71,606	24,402	.....	5,850	18,552	—17,003
Boston & Maine	2,251	2,334,724	1,226,636	3,890,695	540,766	606,788	31,869	1,975,442	127,324	3,282,190	608,504	10,131	199,365	419,270	98,765
Buffalo & Susquehanna	252	141,404	8,307	153,423	27,853	58,801	1,074	55,533	7,691	150,953	2,469	.....	920	1,549	—35,591
Buffalo, Rochester & Pittsburgh	581	718,867	98,565	840,017	85,420	171,406	12,928	327,783	23,807	621,346	218,670	—32	18,000	200,637	—16,010
Butte, Anaconda & Pacific	90	111,509	9,983	132,854	14,377	23,765	703	47,772	2,963	89,582	43,271	.....	3,205	40,065	24,629
Canadian Pacific (Lines in Maine)	233	114,834	44,087	167,843	28,170	18,467	7,605	76,265	6,046	136,554	31,288	.....	11,000	20,288	—3,074
Carolina, Clinchfield & Ohio	248	189,530	17,860	210,867	13,298	26,251	6,803	40,242	9,561	96,156	114,710	.....	9,250	105,460	3,409
Central New England	303	267,091	43,948	327,074	36,723	37,506	1,469	142,311	2,995	221,006	106,067	—313	10,500	95,254	—54,309
Central of Georgia	1,924	881,473	407,341	1,406,627	149,536	233,378	35,515	446,975	39,587	904,993	501,634	5,652	64,892	442,393	92,279
Central of New Jersey	676	1,643,341	423,732	2,140,151	307,127	398,026	31,760	738,802	48,752	1,524,470	615,681	—29,274	110,125	476,281	353,638
Central Vermont	411	222,613	67,039	313,720	39,727	70,985	9,596	182,698	7,973	310,980	2,732	—253	15,500	—13,013	—30,318
Charleston & Western Carolina	340	145,685	44,317	199,993	31,583	28,782	3,752	73,539	4,926	142,583	57,409	.....	5,000	52,409	—8,108
Chesapeake & Ohio	2,345	2,425,633	527,000	3,150,005	327,030	727,242	53,778	1,046,850	79,964	2,234,866	915,139	5,374	113,310	796,454	1,110
Chicago & Alton	1,032	691,606	357,327	1,146,781	124,773	314,932	47,636	498,771	38,974	1,025,087	121,693	3,866	42,500	75,326	47,623
Chicago & Eastern Illinois	1,282	928,284	257,659	1,297,645	165,058	388,005	26,410	504,058	41,165	1,124,698	172,946	—2,887	55,500	114,558	—137,510
Chicago & Erie	269	359,387	61,147	471,093	94,866	123,978	22,526	257,665	12,294	511,332	—40,238	—3,433	16,034	—59,705	—63,318
Chicago & Northwestern	8,090	4,129,203	1,793,462	6,647,657	724,106	964,967	105,662	2,718,792	147,093	4,660,621	1,987,035	—1,639	353,000	1,632,396	—164,074
Chicago, Burlington & Quincy	9,128	5,017,394	1,789,891	7,498,672	643,683	1,196,623	128,118	2,531,609	237,979	4,738,015	2,760,656	—15,537	298,584	2,466,534	—302,827
Chicago Great Western	1,496	815,352	271,563	1,180,631	175,384	176,510	44,131	487,619	37,525	921,169	259,461	—3,091	38,650	217,720	—93,812
Chicago, Indiana & Southern	358	406,472	28,165	447,837	58,129	144,900	6,864	169,090	9,875	388,859	58,977	—1,392	18,053	39,531	—45,080
Chicago, Indianapolis & Louisville	616	367,294	142,153	558,599	73,592	88,180	17,529	224,178	16,858	420,340	138,258	.....	27,125	111,132	—40,428
Chicago Junction	11	.....	.....	168,732	11,692	63,626	953	100,091	4,047	180,410	—11,678	.....	3,621	—15,300	—70,411
Chicago, Milwaukee & St. Paul	9,690	5,443,566	1,592,687	7,652,901	558,497	1,015,504	145,517	2,862,854	134,993	4,717,367	2,935,534	22,296	315,959	2,641,871	58,062
Chicago, Peoria & St. Louis	255	102,515	26,964	138,020	38,570	36,582	6,855	70,239	5,566	157,814	—19,743	.....	4,800	—24,593	—8,302
Chicago, Rock Island & Gulf	476	173,289	60,912	252,620	37,036	30,663	9,566	104,226	7,632	189,125	63,494	—817	11,325	51,351	—67,858
Chicago, Rock Island & Pacific	7,766	3,471,166	1,555,056	5,375,392	427,715	746,825	145,674	2,392,525	173,098	3,885,839	1,489,552	—17,688	316,606	1,155,257	—23,170
Chicago, St. Paul, Minneapolis & Omaha	1,746	947,440	465,843	1,524,340	119,919	181,092	29,352	588,802	36,461	955,629	568,710	—1,035	76,205	491,469	107,067
Chicago, Terre Haute & Southeastern	361	149,760	19,303	173,393	26,661	59,903	3,067	62,222	10,136	161,992	11,401	—368	11,500	—467	—57,875
Cincinnati, Hamilton & Dayton	1,014	612,073	127,658	819,121	126,854	149,136	17,827	408,530	21,060	723,409	95,711	.....	34,712	60,999	—78,077
Cincinnati Northern	244	112,254	20,012	137,729	27,646	29,554	2,451	46,158	3,732	109,544	28,184	.....	6,559	21,625	—14,934
Cleveland, Cincinnati, Chic. & St. Louis	2,013	1,866,654	697,590	2,822,532	228,660	625,981	62,567	1,304,552	63,167	2,284,928	537,604	—1,368	123,762	412,473	—117,103
Colorado & Southern	1,126	326,880	96,063	468,332	83,983	69,907	10,032	261,027	22,363	447,315	21,017	112	35,675	—14,544	—256,942
Colorado Midland	337	98,140	18,848	137,628	22,406	33,561	7,262	65,940	5,885	135,056	2,571	—543	10,000	—7,971	—27,631
Cumberland Valley	162	219,837	55,572	288,648	70,549	31,874	6,503	103,448	13,063	225,439	63,208	287	8,822	54,673	1,384
Delaware & Hudson	853	1,539,857	195,327	1,812,125	116,925	353,787	18,856	913,965	78,338	1,481,873	330,251	358	73,103	257,506	—465,692
Delaware, Lackawanna & Western	959	2,481,507	696,511	3,402,390	269,826	485,424	80,416	1,090,550	78,315	2,004,534	1,397,855	81,497	165,000	1,314,353	—137,049
Denver & Rio Grande	2,585	1,410,226	349,055	1,839,098	177,628	340,348	42,201	655,596	51,209	1,266,984	572,114	—5,211	97,000	469,902	—123,149
Denver & Salt Lake	255	53,879	14,397	71,929	17,494	17,346	1,353	37,733	5,366	79,294	—7,365	.....	40,000	—11,365	—26,207
Detroit & Mackinac	411	41,978	30,952	79,192	10,149	16,956	1,818	33,032	2,604	64,562	14,630	—50	9,604	4,975	—14,718
Detroit & Toledo Shore	78	149,714	.....	150,171	5,764	10,307	2,455	45,118	2,611	66,258	83,913	.....	5,900	78,013	9,451
Detroit, Toledo & Ironton	441	116,308	11,818	140,753	34,351	49,619	3,793	88,519	5,243	181,527	—40,774	.....	5,700	—46,474	—47,693
Duluth & Iron Range	272	80,625	29,649	117,204	61,859	64,606	1,250	81,234	46,982	255,934	—138,730	—7,927	1,702	—148,360	—86,869
Duluth, Missabe & Northern	368	53,073	35,240	93,344	69,285	73,786	1,975	88,694	38,700	272,442	—179,097	—1,556	10,761	—191,415	—63,535

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER, 1913—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total. inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Duluth, South Shore & Atlantic	627	$143,681	$93,698	$251,472	$42,227	$34,903	$9,200	$102,096	$15,801	$204,230	$47,242	$419	$30,034	$17,626	—$16,791
Duluth, Winnipeg & Pacific	181	131,033	27,073	160,480	17,548	23,884	3,245	60,323	5,252	110,253	50,227	.....	8,036	42,190	31,391
El Paso & Southwestern	982	647,087	114,427	795,360	111,977	108,192	15,682	241,890	25,767	503,510	291,850	—3,869	61,256	226,723	—71,606
Elgin, Joliet & Eastern	804	723,556	6	778,160	141,394	213,126	5,901	279,714	48,549	688,686	89,474	.....	32,561	56,913	—353,843
Erie	1,987	3,193,501	781,814	4,382,933	418,814	908,527	104,981	1,652,359	109,133	3,193,816	1,189,116	—23,315	165,114	1,000,686	—57,940
Florence & Cripple Creek	86	45,682	8,176	55,078	15,708	10,133	1,828	28,272	4,179	60,123	—5,044	.....	9,207	—14,251	—59,733
Florida East Coast	695	246,442	165,064	463,714	71,815	62,087	9,354	147,076	11,744	302,078	161,635	—2,203	20,000	139,432	14,885
Fort Worth & Denver City	454	257,139	130,583	408,369	43,456	45,946	6,664	165,558	16,902	278,534	129,835	—476	17,452	111,906	—65,081
Galveston, Harrisburg & San Antonio	1,338	515,585	283,133	854,922	133,341	174,334	36,430	439,665	38,320	822,091	32,830	—2,071	51,815	—21,056	—221,830
Georgia R. R. Lessee Organization	307	178,212	99,870	299,298	23,588	58,028	11,584	137,748	9,033	239,984	59,314	.....	2,566	56,747	2,077
Georgia Southern & Florida	39	142,486	89,830	270,890	30,028	51,168	9,148	101,108	9,840	201,294	69,596	—487	13,298	55,810	6,059
Grand Rapids & Indiana	575	285,928	135,421	454,946	56,992	70,916	12,291	196,774	15,875	352,850	102,096	—1,190	24,690	76,215	—13,864
Grand Trunk Western	347	404,102	174,282	605,873	74,569	92,540	24,030	292,986	21,724	505,851	100,022	—2,338	31,500	66,183	—144,330
Great Northern	7,792	3,982,924	1,223,518	5,564,360	735,976	866,109	106,036	1,761,882	119,812	3,589,817	1,974,542	—6,848	319,658	1,648,036	—1,069,623
Gulf & Ship Island	307	130,463	37,050	178,960	21,175	36,146	3,513	50,869	8,646	120,351	58,609	.....	7,635	50,973	—2,516
Gulf, Colorado & Santa Fe	1,595	704,611	266,946	1,035,204	229,412	168,670	26,752	432,308	33,358	890,503	144,700	.....	65,056	79,644	—287,131
Hocking Valley	351	460,182	79,069	574,411	45,372	134,818	8,753	213,320	14,643	416,907	157,504	.....	41,000	116,504	—43,656
Houston & Texas Central	789	302,352	148,103	493,715	90,914	70,330	14,932	271,075	19,241	466,494	27,220	34	24,219	3,035	—89,427
Houston East & West Texas	190	77,601	41,671	129,273	12,316	10,928	1,896	58,875	4,066	88,084	41,189	.....	2,441	38,747	11,698
Illinois Central	4,762	3,860,932	1,245,549	5,800,376	631,249	1,113,191	113,044	2,147,368	140,752	4,145,606	1,654,770	729	270,744	1,384,755	59,029
Indiana Harbor Belt	104	.....	.....	251,075	35,290	29,981	3,030	126,002	7,966	202,271	48,803	—381	8,771	39,650	—22,740
International & Great Northern	1,159	502,795	203,984	765,629	182,301	51,155	26,308	395,689	34,776	690,231	75,398	—1,889	30,000	43,509	—132,557
Kanawha & Michigan	176	206,153	34,807	247,284	31,728	66,578	2,789	84,645	7,415	193,158	54,125	4	11,145	42,984	—17,621
Kansas City Southern	827	681,231	155,163	928,402	101,206	110,336	27,017	309,811	38,928	587,300	341,101	.....	42,809	298,292	—4,642
Lake Erie & Western	905	360,665	74,746	461,554	68,178	90,560	37,563	202,223	12,194	410,721	50,832	.....	22,394	28,438	—63,225
Lake Shore & Michigan Southern	1,852	2,859,400	1,065,650	4,488,968	602,758	1,583,223	76,456	1,808,777	104,392	4,175,607	313,360	—14,566	392,212	—93,418	—1,624,733
Lehigh & Hudson River	96	148,776	4,037	159,705	16,340	23,775	1,515	59,699	4,254	105,584	54,120	.....	4,000	50,120	1,801
Lehigh & New England	285	161,898	1,177	172,600	16,336	22,277	1,758	52,138	4,806	97,316	75,283	.....	3,178	72,104	—9,442
Lehigh Valley	1,439	2,612,044	377,619	3,105,303	389,954	589,611	89,091	1,191,949	83,296	2,343,902	761,400	—36,370	132,000	593,030	—271,047
Long Island	398	285,150	506,053	887,294	116,541	132,406	11,425	447,474	30,870	738,717	148,576	—4,735	71,115	72,725	—57,069
Louisiana & Arkansas	278	106,243	28,188	139,159	27,751	21,394	2,513	36,788	4,946	93,393	45,765	.....	5,466	40,299	—15,643
Louisiana Ry. & Navigation Co	350	152,371	29,289	193,293	35,028	24,643	5,779	76,036	7,520	149,008	44,285	.....	7,250	37,035	—22,274
Louisiana Western	207	114,244	72,690	196,714	16,846	31,551	7,052	71,341	6,851	134,144	62,570	—44	28,398	34,126	—22,425
Louisville & Nashville	4,923	3,607,978	1,183,849	5,137,723	762,668	1,038,961	114,440	1,797,885	120,256	3,834,211	1,303,512	40	193,438	1,110,114	—129,786
Louisville, Henderson & St. Louis	199	69,793	32,347	109,128	23,690	14,964	4,960	44,173	3,589	91,377	17,751	189	3,600	14,340	—2,358
Maine Central	1,206	575,801	255,322	894,278	95,542	152,955	17,049	371,802	33,144	670,495	223,783	—4,709	47,976	171,097	—9,065
Michigan Central	1,799	1,918,785	751,723	3,002,885	281,258	563,947	48,164	1,318,431	57,149	2,268,951	733,934	—5,340	116,813	611,780	—171,729
Midland Valley	373	83,887	46,100	136,448	34,497	25,090	2,526	53,030	7,587	122,731	13,717	—8	9,495	4,212	—13,314
Minneapolis & St. Louis	1,585	589,528	166,905	806,496	110,944	101,858	17,591	315,396	20,198	565,989	240,506	—75	33,426	207,004	—15,020
Minneapolis, St. Paul & Sault Ste. Marie	3,979	1,540,072	557,859	2,237,164	296,624	401,641	49,753	797,865	57,886	1,603,772	633,392	4,540	58,124	579,807	—563,468
Missouri & North Arkansas	365	65,294	65,396	107,352	29,826	19,108	3,981	45,097	5,538	103,553	3,798	.....	5,500	—1,701	—12,956
Missouri, Kansas & Texas	3,816	1,598,035	841,780	2,627,646	452,204	378,477	60,825	1,090,745	106,845	2,089,098	538,547	—11,642	157,856	369,028	—525,176
Missouri, Oklahoma & Gulf	332	58,353	21,862	84,447	23,333	17,134	5,222	52,612	6,731	105,035	—20,587	341	5,991	26,236	—44,855
Missouri Pacific	3,918	1,473,717	401,265	2,059,044	377,400	416,424	57,346	967,226	70,621	1,889,019	170,024	—2,634	95,900	71,490	—328,350
Mobile & Ohio	1,122	917,943	154,186	1,148,328	117,584	192,438	41,005	445,569	37,351	833,949	314,378	1,150	42,706	270,521	21,695
Monongahela	66	113,678	2,965	118,897	14,425	6,596	563	26,486	2,162	50,234	68,662	.....	2,350	66,312	—24,300
Monongahela Connecting	6	.....	.....	70,601	5,707	14,352	300	35,734	2,538	58,633	11,968	.....	3,332	8,636	—2,819
Morgan's Louis. & Tex. R.R. & S.S. Co.	404	419,025	117,252	573,042	42,108	60,881	12,376	194,740	14,425	324,532	248,509	81	55,592	192,999	46,605
Nashville, Chattanooga & St. Louis	1,231	766,717	284,194	1,127,694	181,433	204,328	45,637	430,256	31,117	892,773	234,921	—3,677	25,340	205,904	—10,994
Nevada Northern	165	144,283	11,994	159,749	19,514	23,280	567	36,013	4,561	83,937	75,812	.....	1,110	74,701	2,554
New Orleans & Northeastern	195	270,257	61,308	356,609	32,254	77,860	10,023	141,703	14,885	276,728	79,881	—665	16,463	62,752	10,331
New Orleans Great Northern	559	115,715	38,920	166,633	21,796	20,719	2,465	48,057	7,349	100,388	66,244	—53	2,833	63,256	13,398
New Orleans, Mobile & Chicago	402	155,189	37,890	203,454	29,672	21,280	4,099	62,448	8,267	125,769	77,685	—83	12,908	64,692	—25,124
New Orleans, Texas & Mexico	285	138,271	21,615	169,366	43,157	9,289	3,901	60,745	6,684	123,771	45,594	.....	.....	45,594	10,653
New York Central & Hudson River	3,750	5,277,105	2,780,723	9,169,409	1,137,128	1,965,277	209,591	3,738,810	279,081	7,329,889	1,839,520	—319	—73,889	1,913,090	—342,358
New York, Chicago & St. Louis	565	888,740	137,740	1,061,687	121,504	100,113	51,234	476,225	20,346	769,424	292,263	—2,899	51,213	238,149	—116,056
New York, New Haven & Hartford	2,059	2,607,673	2,201,548	5,421,211	614,815	902,633	35,756	2,309,968	168,147	4,031,321	1,389,889	7,702	300,000	1,097,592	—148,575
New York, Ontario & Western	565	531,700	91,717	653,336	93,310	149,023	7,324	274,856	17,756	542,271	111,065	1,955	18,900	90,209	—77,398
New York, Philadelphia & Norfolk	112	236,776	46,345	303,774	25,061	72,050	8,536	146,146	13,542	265,338	38,436	.....	9,500	28,936	—32,652
New York, Susquehanna & Western	140	180,304	43,021	245,626	23,698	32,076	1,535	105,932	5,364	168,609	77,016	—4,081	14,083	58,852	—12,143

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER, 1913—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total. inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Norfolk & Western	2,036	$3,182,869	$448,818	$3,759,316	$422,138	$755,095	$68,803	$1,223,666	$80,916	$2,550,619	$1,208,696	$3,829	$140,000	$1,064,867	—$182,180
Norfolk Southern	569	196,229	84,646	304,739	37,310	42,409	5,512	102,376	15,252	202,861	101,878	—273	9,279	92,324	605
Northern Central	472	880,553	204,178	1,164,571	128,511	272,404	16,621	584,350	29,722	1,031,611	132,959	400	42,407	90,952	—127,664
Northern Pacific	6,314	4,057,584	1,267,151	5,681,585	432,870	701,141	97,550	1,879,345	86,707	3,197,615	2,483,970	68,546	353,964	2,198,552	—376,106
Northwestern Pacific	400	100,366	127,341	251,461	47,187	42,832	3,662	108,672	11,902	214,257	37,203	.....	15,100	22,103	—7,944
Oregon Short Line	2,053	1,318,296	399,277	1,840,185	191,467	229,337	39,850	497,223	52,111	1,009,990	830,195	—4,057	162,951	663,185	53,876
Oregon-Washington R. R. & Nav. Co.	1,914	873,223	299,064	1,377,696	145,492	179,687	56,748	577,223	67,287	1,026,439	351,256	—5,088	112,968	233,200	—38,506
Pecos & Northern Texas	481	152,911	42,733	207,013	14,965	34,760	3,127	63,719	6,837	123,410	83,602	.....	7,910	75,692	4,594
Pennsylvania *Company*	1,750	3,203,693	856,946	4,602,927	697,450	886,968	99,505	1,927,939	113,755	3,725,619	877,308	—13,522	385,248	478,536	—413,727
Pennsylvania *R. R.*	4,043	10,874,633	3,125,973	15,030,698	2,033,413	3,075,521	211,999	5,872,622	406,059	11,599,616	3,431,082	—153,524	589,890	2,687,667	274,058
Peoria & Eastern	351	181,729	64,221	265,922	33,002	47,624	4,607	121,069	6,067	212,369	53,552	.....	3,505	50,047	—47,099
Pere Marquette	2,324	990,275	329,635	1,450,269	169,835	389,700	34,952	651,269	44,420	1,290,177	160,092	—9,424	49,790	100,876	—224,559
Philadelphia & Reading	1,020	3,279,056	578,999	4,033,491	345,499	697,410	42,742	1,393,117	64,914	2,543,685	1,489,806	5,048	102,770	1,392,084	—354,389
Philadelphia, Baltimore & Washington	717	824,841	720,020	1,730,356	224,624	308,641	31,960	779,446	52,202	1,396,875	330,480	.....	53,065	280,415	86,161
Pittsburgh & Lake Erie	224	977,540	150,293	1,176,371	123,316	279,112	18,212	372,406	31,455	824,503	351,868	—1,195	71,885	278,787	—508,174
Pittsburgh, Cincinnati, Chic. & St. Louis	1,472	2,191,960	769,439	3,392,138	477,463	693,862	84,935	1,469,074	85,612	2,810,949	581,189	—757	218,365	362,065	—405,755
Pittsburgh, Shawmut & Northern	282	184,764	12,245	200,294	28,557	52,419	1,958	69,875	5,405	158,236	42,058	.....	1,833	40,224	—12,691
Port Reading	21	118,525	.....	119,441	11,164	36	40	37,244	1,486	47,000	72,441	9,794	10,000	72,235	—127
Richmond, Fredericksburg & Potomac	87	127,041	84,218	240,688	21,560	25,884	2,933	95,170	7,473	153,022	87,666	—7,663	8,687	71,315	—34,208
Rutland	468	152,409	98,796	291,769	45,018	50,215	8,184	127,126	9,826	240,372	51,396	—46	17,144	34,205	—865
St. Joseph & Grand Island	318	94,394	29,485	133,764	23,008	21,679	5,021	70,728	6,449	126,888	6,876	167	13,167	—6,124	—9,519
St. Louis & San Francisco	4,471	2,279,572	1,020,496	3,578,567	670,351	503,721	68,560	1,258,344	124,026	2,625,004	953,563	.....	102,343	851,219	—458,797
St. Louis, Brownsville & Mexico	517	90,119	63,159	171,020	73,371	22,424	4,562	73,632	10,117	184,109	—13,088	.....	21,228	—34,317	—80,373
St. Louis, Iron Mountain & Southern	3,364	2,202,745	621,155	3,024,512	410,094	413,520	53,779	874,606	74,524	1,826,524	1,197,987	—1,021	96,135	1,100,831	154,440
St. Louis Merchants' Bridge Terminal	9	.....	347	161,985	29,477	11,812	706	90,919	5,820	138,736	23,249	.....	7,650	15,598	—27,145
St. Louis, San Francisco & Texas	243	84,123	34,548	128,144	24,305	20,511	2,254	60,818	4,804	112,695	15,448	.....	2,686	12,762	—31,032
St. Louis Southwestern	905	551,125	160,459	755,008	65,766	122,460	31,372	176,806	28,066	424,472	330,536	—1,253	30,232	299,051	—75,498
St. Louis Southwestern of Texas	810	264,137	128,581	423,335	84,975	89,501	14,707	171,245	19,724	380,154	43,181	84	30,261	13,004	—43,362
San Antonio & Aransas Pass	724	168,736	96,019	288,374	138,858	57,999	5,559	137,296	11,751	351,466	—63,091	.....	12,000	—75,091	—202,780
San Pedro, Los Angeles & Salt Lake	1,133	557,335	275,335	916,103	91,980	145,269	31,548	323,516	17,620	609,935	306,168	—2,567	33,404	270,196	40,571
Seaboard Air Line	3,081	1,573,823	540,712	2,324,872	322,093	308,276	64,342	808,104	66,340	1,569,157	755,715	—3,244	82,000	670,470	61,384
Southern Kansas of Texas	179	82,746	15,172	103,677	6,813	22,733	1,651	35,855	3,997	71,052	32,624	.....	2,276	30,348	—19,527
Southern Pacific	6,438	4,227,753	2,470,946	7,326,410	778,265	1,016,495	157,590	2,259,038	252,099	4,463,489	2,862,920	56,782	435,043	2,484,660	—272,386
Southern Railway	7,036	4,071,218	1,857,276	6,489,204	702,198	1,013,562	184,579	2,154,994	195,715	4,251,050	2,238,154	16,209	245,413	2,008,949	120,532
Southern in Mississippi	280	92,279	61,317	164,133	26,206	10,683	2,201	52,684	4,603	96,380	67,753	.....	20,256	47,496	9,105
Spokane International	163	56,936	19,874	79,639	11,630	6,659	1,932	25,828	4,517	50,568	29,070	.....	7,887	21,183	19,758
Spokane, Portland & Seattle	556	238,403	123,251	388,066	68,448	40,030	7,506	108,347	13,487	237,820	150,245	—434	53,400	96,410	—68,709
Tennessee Central	293	105,153	38,520	151,179	27,096	21,289	5,726	50,844	7,128	112,085	39,094	.....	4,245	34,848	9,597
Terminal R. R. Association of St. Louis	33	.....	150	226,919	31,159	19,401	939	101,750	6,658	159,910	67,008	12,922	39,465	40,465	—37,529
Texas & New Orleans	458	210,907	115,457	354,460	53,087	82,375	8,976	153,083	14,082	311,606	42,854	277	13,523	29,607	—6,734
Texas & Pacific	1,884	1,284,145	507,759	1,898,759	188,992	253,673	38,612	796,611	48,873	1,326,763	571,996	—5,937	102,965	463,093	4,521
Toledo & Ohio Central	442	416,762	56,771	493,594	108,252	105,993	7,590	193,259	11,169	426,266	67,328	—789	25,580	40,958	—37,245
Toledo, Peoria & Western	247	55,315	43,671	104,985	20,360	30,857	2,299	50,379	3,862	107,759	—2,733	.....	6,800	—9,573	—19,640
Toledo, St. Louis & Western	450	355,203	29,244	408,350	39,276	51,559	16,175	157,906	9,547	274,465	133,884	.....	16,600	117,284	—25,400
Trinity & Brazos Valley	462	177,996	57,671	246,798	60,053	34,841	10,232	110,128	13,620	228,874	17,923	.....	7,782	10,141	—68,198
Ulster & Delaware	128	49,084	16,956	70,674	9,566	11,102	1,080	37,335	5,606	64,690	5,984	197	3,500	2,681	—8,744
Union of Pennsylvania	31	.....	.....	254,821	63,273	104,859	103	146,901	13,897	329,035	—74,214	6,453	8,500	—76,260	—78,224
Union of Baltimore	9	118,616	22,861	143,476	10,601	.....	1,390	1,947	3,045	16,985	126,491	.....	5,021	121,470	—12,919
Union Pacific	2,614	2,817,245	843,990	4,093,457	417,352	630,232	105,559	1,280,095	130,467	2,563,708	1,529,749	—12,748	224,338	1,292,662	—458,477
Vandalia	910	644,440	205,218	954,603	100,650	157,376	26,867	378,615	20,695	684,205	270,397	.....	33,291	237,106	22,351
Vicksburg, Shreveport & Pacific	171	90,727	65,113	168,946	19,525	28,384	3,560	53,303	5,628	110,401	58,544	—305	661	57,579	10,885
Virginia & Southwestern	240	130,030	17,638	152,152	20,784	41,460	2,272	46,521	4,034	115,074	37,078	.....	6,181	30,897	235
Virginian	503	472,326	36,059	522,394	67,856	82,509	4,841	134,983	10,129	300,321	222,073	6,431	22,650	205,855	38,342
Wabash	2,514	1,656,220	616,483	2,487,465	315,188	495,198	90,858	1,119,983	68,012	2,089,241	398,223	—4,797	79,922	313,503	—118,737
Washington Southern	35	38,838	41,957	108,640	12,768	14,889	1,224	45,565	3,495	77,943	30,697	96	3,468	27,132	—8,417
West Jersey & Seashore	355	144,556	214,196	384,860	53,049	60,513	15,153	215,013	15,219	358,949	25,911	—2,355	17,177	6,377	2,882
Western Maryland	661	578,682	67,688	676,249	95,642	122,515	23,199	338,804	21,805	596,967	79,282	.....	21,000	58,282	—11,974
Western Pacific	936	353,433	76,503	448,822	111,046	63,379	31,512	192,958	25,635	424,532	20,290	—4,181	34,363	—18,254	—100,715
Western of Alabama	133	81,942	53,438	145,782	20,899	25,258	6,287	36,360	5,671	94,477	61,304	128	5,434	45,998	4,825
Wheeling & Lake Erie	459	486,208	52,221	576,273	41,378	105,533	7,559	214,225	19,454	388,152	188,121	—152	29,683	158,285	51,447
Yazoo & Mississippi Valley	1,371	1,030,410	387,194	1,488,270	109,679	136,402	15,181	470,667	28,570	760,501	727,768	172	43,000	684,941	344,122

miscellaneous, and a decrease of 226 in flat car shortage. The increase in box car shortage is in groups 1, 3 and 6 (as above). The increase in coal and gondola car shortage is in groups 6 and 10 (as above). The increase in miscellaneous car shortage is in groups 5, 6 and 10 (as above). The decrease in flat car shortage is in group 6 (as above).

Compared with the corresponding period of last year; there is an increase in the total car surplus of 146,685 cars, of which 48,023 is in box, 6,718 in flat, 72,532 in coal and gondola, and 19,412 in miscellaneous car surplus. There is a decrease in the total car shortage of 28,184 cars, of which 17,786 is in box, 1,666 in flat, 6,957 in coal and gondola, and 1,775 in miscellaneous car shortage.

The table on page 481 gives car surplus and shortage figures by groups for the last period covered in the report and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1914.

L. & N. Traffic Club

This is the name of an association of officers and employees of the traffic department of the Louisville & Nashville, which holds a dinner once a year. The club is now four years old, and the members express decided s tisfaction with the results of their venture, the purpose being mainly or wholly to promote acquaintance between men of different offices and those working in different cities. At the fourth annual banquet, which was held in Louisville on the evening of February 21, the number of persons present was about 200, including some men from other departments. D. M. Goodwyn, general freight agent, was the toastmaster, and toasts were responded to by J. H. Ellis, G. W. Lamb, J. E. Crosland, W. F. Sheridan, R. D. Pusey, E. H. Dulaney, V. C. Griffin and W. A. Northcutt. The president of the club is G. C. Tevol, Louisville.

Extension of Parcel Post Unwise

The directors of the Merchants' Association of New York City have adopted resolutions in opposition to the expansion of the parcel post service. They set forth that the extension of the weight limit to 100 lb. would so deplete the volume of traffic available to the express companies as to make their operation profitless and force their retirement. The express companies give a service which cannot be supplied by the parcel post, and which is required for the needs of commerce.

In a memorial addressed to Congress it is stated that the parcel post omits the following essentials of a complete service:

1. It does not collect parcels;
2. It does not give receipts;
3. It does not provide indemnity for loss, except upon extra payment and only to the amount of $50;
4. It does not provide any indemnity for damage;
5. It does not provide controlling records, by reason of which omission the volume of loss is increased;
6. It does not provide special means of security for valuable parcels.
7. It does not provide adequate protection against damage;
8. It does not provide for the transportation of a wide range of special commodities.

The New York *Tribune* says:

"Are the express companies to survive? The rumored liquidation of one of them [the United States, operating over the Central of New Jersey, the Reading, the Baltimore & Ohio, the Lackawanna, the Lehigh Valley and the Rock Island] shows how serious is the situation confronting the big companies. The operating expenses of this particular company have exceeded its operating earnings for the last two years. It would be unfortunate if the competition of the United States parcel post should force the express companies from the field. There has been complaint in the past, but the competition of government parcel transportation is assurance of their good behavior for the future. As a competitor Uncle Sam is not much better than the trusts he castigates. He sells services below cost and extorts favors from the railroads. His business of carrying parcels may show a bookkeeping profit, but it shows one only because the railroads are forced to carry parcels below cost. And if the government obtains a monopoly of the parcel transportation business that monopoly is likely to turn out to be just as stolid and unprogressive as any other monopoly."

At a hearing before the Senate post office committee at Washington, February 25, representatives of the Expressmen's League of Boston asked that Congress forbid the postmaster general to increase further the weight of packages allowed to be carried by the parcels post. The expressmen said that they represented 400 local concerns employing 2,000 persons and having investments aggregating $2,000,000.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has further suspended from March 19 to September 19, a Grand Trunk tariff withdrawing the privilege of reconsigning shipments of coal at Milwaukee, Wis.

The commission has suspended from March 1 to June 29, an item in an Atchison, Topeka & Santa Fe tariff increasing rates on gypsum in carloads, from Winslow, Ariz., to Los Angeles, and other points in California.

The commission has further suspended from March 12 to September 12, a tariff of F V. Davis, agent, canceling proportional rates on coal, in carloads, from mines in Ohio to Mississippi river crossings when for beyond.

Examiner Eddy held a hearing in Chicago on February 24 on a complaint filed by the Monon Coal Company, of Chicago, asking a readjustment of the rates on coal from the Indiana coal fields to Chicago. A reduction is asked from the Brazil and Clinton districts.

The commission has further suspended from March 15 to September 15, a Louisville & Nashville tariff increasing rates on products of cottonseed oil in carloads, from New Orleans and Gulfport, Miss., to Ohio river crossings, and to certain points north.

The commission has suspended from March 3 to July 1 an item in a tariff of F. A. Leland, agent, increasing rates on fertilizer material, in carloads, from New Orleans, La., and points taking the same rates, to Texarkana, Ark.-Tex., and points taking the same rates.

Representatives of the New Orleans Live Stock Exchange appeared at a hearing before Special Examiner Wood of the Interstate Commerce Commission, on January 20, at New Orleans, to protest against the rate of $2.50 per car charged by the railways for cleaning cattle cars.

The commission has further suspended from March 10 to September 10, certain schedules in tariffs of F. A., agent, Leland, by which it was proposed to cancel the present commodity rate on peanuts in carloads, from New Orleans and other points in Louisiana to Oklahoma City.

The commission has suspended from March 5 to July 3, certain express tariffs of F. G. Airy, agent, proposing to cancel a provision relating to the opening and partial unloading of fish shipped in carloads from express offices in Oregon and Washington to Chicago, New York and various other points.

The commission has further suspended from March 7 to September 7, a Chicago & North Western tariff containing a proposed rule stating that reconsigning orders for points beyond the rails of the Chicago & North Western or the Chicago, St. Paul, Minneapolis & Omaha will not be accepted on perishable or other freight when loaded in refrigerator cars of these roads.

Ten more railroads have applied to the commission for relief from the operation of that provision of the Panama Canal act which requires railroads to cease owning water-line holdings before July 1, unless the commission shall exempt them from the law. The applicants were the Oregon-Washington Railroad & Navigation Company, the Southern Pacific, the Central Pacific, the Delaware, Lackawanna & Western, the New York, Ontario & Western, the Lehigh Valley, the Long Island and Morgan's Louisiana & Texas Railroad & Steamship Company; the Central Vermont and the Baltimore-Chesapeake & Atlantic.

The commission has set aside certain of its orders relating to the filing of applications for relief under the fourth section in order to reissue them as one order effective March 15. The new order is numbered Fourth Section Order No. 3700, General No. 13, and says as to applications filed on or before February 17, 1911, not yet passed on by the commission, that carriers may file such changes as occur in the ordinary course of business, continuing higher rates or fares at intermediate points and through rates or fares higher than the combination of inter-

mediates, provided the discrimination against intermediate points be not increased. Carriers are also allowed, in cases covered by the same applications, to file changes in rates under certain conditions, enumerated in 12 sections for tariff reference, even though the discrimination against intermediate points is increased.

Rates on Lumber Trimmings

Green Brothers Box & Lumber Company v. Chicago & North Western. Opinion by the commission:

The complainant having shipped a quantity of lumber trimmings from Odana, Wis., to Rockford, Ill., was charged the lumber rate of 13 cents. The commission finds that a rate of seven or nine cents on fuel wood would have been too low, and holds that the rate of 13 cents was unreasonable, and that it should not have exceeded 10.5 cents. Reparation awarded. (29 I. C. C., 473.)

Examination of Books Required Under Transit Rules

William F. Gadow v. Chicago, St. Paul, Minneapolis & Omaha et al. Opinion by the commission:

The commission finds that the withdrawal by defendants of the transit rates published on grain at Barton, Wis., pending complainant's refusal to permit an inspection of his transit accounts at that point was in harmony with the tariff requirements and not unreasonable or unlawful. (29 I. C. C., 457.)

Rates on Salt from New York Points

Swift & Company v. Pennsylvania Railroad et al. Opinion by Commissioner Harlan:

The commission finds that the rate on coarse salt in bulk from Cuylerville to Chicago Junction, Ill., was unreasonable, since it exceeded 78 per cent. of the New York-Chicago rate of 14 cents on that commodity and prescribes the percentage rate for the future. It is also required that a present through route for coarse salt in bulk from Cuylerville to Chicago Junction through Akron, Ohio, be maintained and that a joint rate not exceeding 11 cents be established. Reparation is not allowed, however, on salt shipments from Cuylerville to Port Huron and Delray, Mich., which, although they are on the lakes, do not have the advantages of water competition that Chicago has. (29 I. C. C., 464.)

Kansas-California Flour Rates

Opinion by Commissioner Clements:

At the present time millers in Kansas, Nebraska and Oklahoma may obtain wheat, mill it in transit and ship the flour to California terminals at a rate of 65 cents, which is the rate on the flour from the original point of origin of the wheat. The commission finds that an increase in that rate to 75 cents, thereby increasing the spread between flour and wheat from 7 to 17 cents, is not justified. The Kansas miller has a substantial advantage over the miller in California, but that is due rather to the result of natural advantages, which should not be equalized by giving the California miller an additional advantage in the differential. (29 I. C. C., 459.)

Arizona Wheat Rates

Arizona Corporation Commission v. Arizona & New Mexico et al. Opinion by Commissioner Clements:

The commission finds that the rates on flour and other grain products from Kansas, Oklahoma, Nebraska, Colorado, Iowa and Missouri to points in Arizona are unduly detrimental to the latter as compared to the rates on the same products to Pacific coast terminals, and it is found that such rates as $1.12 from Hutchinson, Kan., to Phoenix should not exceed the rate of 65 cents to the coast. It is also held that a proposed increase from 58 cents to $1 on wheat to California terminals is not justified. (29 I. C. C., 424.)

In the Matter of Bills of Lading

Opinion by Commissioner Clements:

This case relates to section 3, paragraph 3 of the uniform bill of lading which requires that all claims for loss or damage must be made within four months of delivery. The clause, although incorporated in the classifications and class tariffs was omitted in many commodity tariffs and not observed uniformly. The commission decides in answer to a request for the approval of the waiver of the clause that it has no authority to order carriers to disregard their tariffs. In view of the discrimination that might result, however, it is held that the carriers should deal with the claims on shipments moving prior to December 1, 1913, without discrimination and regardless of the four months' rule, but that hereafter the rule should be rigidly adhered to and uniformly observed as to all shippers. The commission does not pass upon the reasonableness of the rule. (29 I. C. C., 417.)

STATE COMMISSIONS

The Texas Railroad Commission has ordered the Pecos & Northern Texas to erect a station building at Hurley, Bailey county, and install necessary sidings and spur tracks to handle all business tendered. The commission holds that the railroad company had previously designated Hurley as a station, and therefore it is bound to provide facilities. In taking this position, the commission does not assert that it has the power to require a railroad to establish a station, but only to compel the provision of adequate facilities once a station is designated or established. The railroad company will probably contest the commission's order in court.

The Kansas Public Utilities Commission has rendered an opinion on the complaint of the Kansas City Board of Trade that ten of the trunk line railways entering that city charged excessive rates on grain shipped to Kansas City from points in Missouri by considering such rates as interstate in character because they were shipped to Kansas City, Kan., instead of applying the lower intrastate rates. The commission holds that as to the Missouri Pacific, Kansas City Southern, Wabash, Chicago & Alton, Chicago, Burlington & Quincy, and Chicago, Milwaukee & St. Paul, the intrastate rates must be applied. The complaints against the Missouri, Kansas & Texas, St. Louis & San Francisco, Chicago, Rock Island & Pacific, and Atchison, Topeka & Santa Fe are dismissed on the ground that on shipments over these lines the interstate rate is properly charged.

PERSONNEL OF COMMISSIONS

Hon. Joseph W. Folk has been appointed chief counsel for the Interstate Commerce Commission, with jurisdiction and supervision over all of the law work of the commission, including the Division of Valuation. Patrick J. Farrell is transferred to the Division of Valuation, Interstate Commerce Commission, as solicitor of that division. Charles W. Needham has been appointed assistant counsel for the commission. The titles of solicitor and assistant solicitor of the commission have been abolished.

Joseph Wingate Folk, former governor of Missouri, who has been appointed chief counsel of the Interstate Commerce Commission, will have a salary of $10,000 a year, the same as that of the members of the commission. Mr. Folk was born October 28, 1869, at Brownsville, Tenn., and was educated at private and public schools, and at Vanderbilt University, Nashville, graduating from the university in 1890. For four years he practiced law, at Brownsville, and then (1894) moved to St. Louis. There he engaged in general civil practice, and in 1900 was elected circuit attorney for the city of St. Louis. In this office he served four years, prosecuting a large number of cases, and he became a national figure. His vigor as a terror to evil-doers in official positions made him popular throughout the state, and in 1904 he was elected governor over very strong opposition. He held that office four years, where he continued his public-

J. W. Folk

spirited services. He was appointed solicitor for the Department of State, at Washington, September 22 last, and from that position he has now resigned to take the place of chief counsel for the Interstate Commerce Commission.

Charles Willis Needham, who has been appointed assistant chief counsel for the Interstate Commerce Commission, was born in Wyoming county, N. Y., on September 30, 1848. He was educated in the public schools and graduated from the Albany Law School in 1869. He commenced the practice of law in Wyoming county, but later went to Morris, Ill., and to Chicago, where he practiced from 1876 to 1890, being engaged in active court practice and in the organization of railroad and allied corporations. In 1890 he went to Washington and continued to practice law until 1898, during which time he was principally engaged as counsel for railroads and allied interests. In 1898 he was elected dean of the law school of Columbian University, and organized the School of Comparative Jurisprudence and Diplomacy. In 1902 he was elected president of the university, and held that position until June, 1910. During his term of office he placed the university upon a non-sectarian basis and its name was changed to George Washington University. Since 1910 Mr. Needham has been connected with the Interstate Commerce Commission, and has conducted the defense of its orders in the Commerce and Supreme courts. Among important cases with which he has been connected are: the water carrier cases, the Kansas City Southern case; the tap line cases and the pipe line cases.

C. W. Needham

C. H. Spencer, engineer of the Washington Terminal Company at Washington, D. C., has been appointed assistant district engineer of the Eastern district, Division of Valuation, Interstate Commerce Commission, with office at Washington. Mr. Spencer was born May 7, 1867, at Detroit, Mich., and was graduated from the University of Michigan in 1896. He began railway work in March, 1897, with the Lake Shore & Michigan Southern as rodman, and during 1898 was transitman for that road. From 1899 to June, 1900, he was chief draftsman for the Southern Indiana, and was then, until January, 1903, chief draftsman and engineer of construction of the Baltimore & Ohio. The following six months he was assistant engineer of the same road, when he was made resident engineer of that road in charge of the construction of the Washington Terminal at Washington, D. C. Upon completion of the terminal in 1908 Mr. Spencer was appointed engineer of the Washington Terminal Company, which position he has resigned to become assistant district engineer of the Eastern district, Division of Valuation, Interstate Commerce Commission, as above noted.

C. H. Spencer

COURT NEWS

The United States District Court at St. Louis, Judges Sanborn, Hook and Smith, has handed down a decision holding that the Terminal Railroad Association of St. Louis is an unlawful combination, contrary to the anti-trust act, insofar as it and the various bridge and terminal companies are operated as railroad transportation companies. The opinion holds that the various companies may exist and continue, however, as a lawful unification of terminal facilities, upon abandoning all operating methods and charges as and for railroad transportation and confining themselves to the transaction of a terminal business. The decree enjoins them from making any special or arbitrary charge for the use of the terminal facilities in respect of traffic originating within the so-called 100-mile area.

The agricultural department has announced that prosecutions against carriers for violation of the live-stock quarantine law have resulted in the following convictions reported in the period from December 11, 1913 to January 31, 1914. Louisville & Nashville and Wichita Falls & North Western, each fined $100 for transporting cattle affected with scabies and the Missouri, Kansas & Texas fined $200 for a movement of sheep affected with Texas fever ticks. In the period from December 11, 1913, to January 10, 1914, 88 convictions resulting in fines of $10,548.50 were found against carriers for violation of the 28-hour law. Of this amount the Illinois Central paid $3,050.68 in 29 cases; the Cleveland, Cincinnati, Chicago & St. Louis, $2,367.59 in 20 cases; the Michigan Central, $1,516.96 in 13 cases, and 16 other roads the remainder.

Decision by Judge Knapp on Hours of Telegraphers

The United States Circuit Court of Appeals, fourth circuit, in a decision by Judge Knapp, late chief judge of the Commerce Court and formerly chairman of the Interstate Commerce Commission, holds that a telegraph office which is regularly kept open from 6:30 a. m. to 10:15 p. m. is to be classed, not as a day office, in which operators may work only 13 hours, but as a 24-hour office in which the time limit for each operator is 9 hours.

The case arose in connection with the office of the Atlantic Coast Line at Bennettsville, S. C. The decision, concurred in by Judges Woods and Rose, says:

The hours of service act is not a criminal statute, and therefore is not governed by the rule of strict construction; it is rather a remedial statute, which should be so construed, if its language permits, as to best accomplish the protective purpose for which it was enacted, the end to be attained by the law being a guide to its interpretation.

The objects of the law require that a preference be accorded to a construction which recognizes the legislative intent to permit 13 hours of service in offices kept open only such number of hours in the aggregate as do not materially or substantially exceed the length of an ordinary day and to prohibit more than 9 hours' service in offices kept open such number of hours in the aggregate as necessarily include a material or substantial portion of the night.

The statute assumes that all offices will be operated during the daytime, and for those operated during the daytime only it makes the 13-hour requirement; for those which are operated during the daytime with a continuance of operation into the night it makes the 9-hour requirement.

The office in question falls into the 9-hour class.

In support of these conclusions the decision says, in part:

The natural significance of terms must yield to the necessity for giving to the entire proviso such reasonable meaning as will promote its beneficial purpose. If it seems a strained and unwarranted construction to hold that an office which is generally closed at 10:15 p. m., and never later than 11, and kept closed till 6:30 a. m., is nevertheless "continously operated night and day," is it not equally strained and unwarranted to hold that an office which is kept open from 6:30 a. m. to 10:15 p. m., or later, is nevertheless "operated only during the daytime"? Since the office in question must be assigned to one class or the other, we are of opinion on the whole that it will be more correctly and usefully placed in the night and day class than in the daytime class. If this conclusion gives greater effect to the words "operated only during the daytime" than to the words "continuously operated night and day," we think the objects of the law require that preference be accorded to a construction which recognizes the legislative intent. . . .

Railway Officers

Executive, Financial, Legal and Accounting

W. K. Bixby has resigned as receiver of the Wabash.

R. T. Bailey, general attorney of the Missouri Pacific at St. Louis, Mo., has resigned.

Frank S. Hill, assistant chief claim agent of the Lake Erie & Western, has been appointed chief claim agent, with office at Indianapolis, Ind.

I. McQuilkin, controller of the Carolina, Clinchfield & Ohio at Johnson City, Tenn., has been elected vice-president in charge of finances and accounts.

E. H. Lee, chief engineer of the Chicago & Western Indiana and the Belt Railway of Chicago, at Chicago, has been given the position of vice-president and chief engineer of those roads.

Louis W. Hill, chairman of the board of directors of the Great Northern, has been elected president of the company, succeeding Carl R. Gray, resigned. Mr. Hill will retain the title of chairman of the board ex officio.

J. J. Turner, first vice-president of the Pennsylvania Lines West of Pittsburgh and president of the Vandalia, with headquarters at Pittsburgh, Pa., also has been elected president of the Grand Rapids & Indiana, succeeding Joseph Wood, resigned.

H. S. Simpson has resigned as land, tax and claim agent of the Chicago & Alton and the office has been abolished. D. J. Corkery has been appointed real estate and tax agent, and J. H. Howard, freight claim agent, has been appointed general claim agent, both with headquarters at Chicago.

Edward D. Adams, chairman of the board of the Western Maryland at New York, and J. M. Fitzgerald, president at Baltimore, Md., have resigned and will be succeeded by Carl R. Gray, president of the Great Northern, who will be elected chairman of the board and president of the Western Maryland, with headquarters at Baltimore, Md. A portrait of Mr. Gray and a sketch of his railway career, were published in the *Railway Age Gazette* of May 10, 1912, page 1058.

Charles N. Whitehead, whose election as vice-president of the Missouri, Kansas & Texas, with headquarters at St. Louis, Mo., has been noted in these columns, was born January 23, 1878, at Princeton, Ill. He was educated in the public schools and began railway work in 1893 as messenger for the Missouri, Kansas & Texas, with which road he has remained ever since. He was clerk and stenographer in the freight and ticket office until 1895, and the following three years was stenographer and clerk to the superintendent. From 1898 to 1900 he served in the same capacity to the general freight agent and the following year held the same position in the office of the general attorney. The next year he was chief clerk to the superintendent and then for three years was stenographer and clerk to the general counsel. Mr. Whitehead was appointed assistant secretary in 1905, secretary in 1906 and in 1909 was made secretary and treasurer. He was appointed assistant to the president in April, 1913, and now becomes a vice-president, as above noted.

Photo by Matzene, Chicago.
C. N. Whitehead

Operating

G. E. Reel, trainmaster of the Cincinnati, Hamilton & Dayton at Dayton, Ohio, has been transferred to Lima, Ohio, in a similar capacity.

H. H. Germain has been appointed superintendent of special service of the Rock Island Lines, with headquarters at Chicago, effective March 1.

L. H. Phetteplace, general superintendent of the Carolina, Clinchfield & Ohio, has been appointed general manager, with headquarters at Erwin, Tenn.

G. W. Hulsizer, signal engineer of the Chicago & Alton, has been appointed superintendent of telegraph, with headquarters at Chicago, succeeding T. M. Haston, resigned.

H. Weitzel has been appointed assistant superintendent of the Phoenix and Halden divisions of the Arizona Eastern, with office at Phoenix, Ariz., succeeding D. Reid, resigned.

F. L. Burckhalter, district engineer of the Southern Pacific at Portland, Ore., has been appointed division superintendent, with headquarters at Portland, succeeding L. R. Fields.

William Bartley, car accountant of the Lake Erie & Western, has been appointed superintendent of car service, with office at Indianapolis, Ind., and the former office has been abolished.

H. E. Correll, trainmaster of the Chicago, Rock Island & Pacific, at Eldon, Mo., has been appointed superintendent of the St. Louis division, with headquarters at Eldon, succeeding H. L. Reed, who has been transferred to Fairbury, Neb., as superintendent of the Nebraska division in place of A. W. Kelso, resigned.

J. M. Davis, who became assistant general manager of the Baltimore & Ohio Southwestern-Cincinnati, Hamilton & Dayton lines, on January 1, 1914, has been appointed general manager of those lines with headquarters at Cincinnati, O., succeeding W. C. Loree, resigned. A portrait of Mr. Davis and a sketch of his railway career were published in the *Railway Age Gazette* of January 9, 1914, page 99.

D. Cunningham, superintendent of the La Crosse division of the Chicago, Burlington & Quincy, has been appointed chief examiner of train rules for the entire system, with office at La Crosse, Wis. W. E. Thiehoff, superintendent of the Beardstown division at Beardstown, Ill., succeeds Mr. Cunningham, with headquarters at La Crosse, and Frank Cone, assistant superintendent at La Crosse, takes the place of Mr. Thiehoff.

Traffic

H. H. Berterman has been appointed general agent passenger department of the Cleveland, Cincinnati, Chicago & St. Louis, at Columbus, Ohio, to succeed B. C. Kelsey, resigned to engage in other business.

F. C. Fletcher, general livestock agent of the Missouri Pacific and St. Louis, Iron Mountain & Southern, at Kansas City, Mo., has been appointed traffic manager of the Union Stock Yards Company of St. Joseph, Mo.

Ira H. Hubbel, general freight agent of the New York Central & Hudson River and the West Shore at New York, has been appointed assistant freight traffic manager of the New York Central Lines east of Buffalo, N. Y., in place of Herbert D. Carter, deceased; and William A. Newman succeeds Mr. Hubbel.

F. R. Dalzell, division freight agent of the Gulf, Colorado & Santa Fe at Dallas, Tex., has been appointed assistant general freight agent, with office at Galveston, Tex., to succeed A. C. Fonda, resigned, to become agent of the Texas Tariff Bureau. A. Landry, assistant general freight agent at Galveston, has been transferred to Dallas in place of Mr. Dalzell.

W. H. Abel, assistant general passenger agent of the Chicago & Alton at Kansas City, Mo., has been appointed assistant passenger traffic manager, with headquarters at St. Louis, Mo. W. C. Mueller, general agent passenger department at St. Louis, Mo., has been transferred to Kansas City, Mo., in a similar capacity, succeeding Mr. Abel. R. J. McKay, assistant general passenger agent at St. Louis, has resigned to engage in other business.

Engineering and Rolling Stock

D. C. Wilson has been appointed electrical engineer of the Union Pacific, with headquarters at Omaha, Neb., succeeding A. J. Collett, resigned.

F. W. Bettle, assistant engineer for the Terminal Association of St. Louis, has been appointed division engineer of the Texas & Pacific, with headquarters at New Orleans, La.

W. S. Hanley, division engineer of the New Orleans Great Northern, has been appointed chief engineer, with office at Bogalusa, La., and the office of division engineer has been abolished.

Charles F. Barnhill has been appointed master mechanic of the Beaumont division of the Gulf, Colorado & Santa Fe, with headquarters at Silsbee, Tex., succeeding A. B. Adams, deceased.

Arthur Maguire, division engineer of the San Pedro, Los Angeles & Salt Lake, has been appointed chief engineer, with headquarters at Los Angeles, Cal., succeeding E. G. Tilton, resigned.

C. E. Apple, in the engineering department of the San Antonio & Aransas Pass, in charge of steel and concrete construction, has been appointed supervisor of bridges and buildings, with headquarters at Yoakum, Tex.

F. H. Buchanan, supervisor of signals of the Vandalia at Terre Haute, Ind., has been appointed signal engineer of the Pennsylvania Lines West of Pittsburgh, with office at Pittsburgh, Pa., succeeding W. McC. Grafton, deceased.

C. S. Heritage has been appointed engineer of the Washington Terminal Company, at Washington, D. C., succeeding C. H. Spencer, resigned to accept the position of assistant district engineer of the Eastern district, Division of Valuation, Interstate Commerce Commission, at Washington.

W. E. Guignon, assistant engineer of the Northwest system of the Pennsylvania Lines West of Pittsburgh, with office at Chicago, has been appointed division engineer of the Zanesville division of the Central system, with headquarters at Zanesville, Ohio, to succeed A. C. Watson, transferred; effective March 1.

E. L. Crugar has resigned as assistant chief engineer of the Chicago & Alton, and the office is abolished. I. C. Brower and C. A. Stelle, division engineers at Bloomington, Ill., and C. L. Hartford, division engineer at Mexico, Mo., have resigned, and the office of division engineer is abolished. The office of roadmaster has been created and the following supervisors have been appointed roadmasters: J. P. Corcoran, transferred from Joliet, Ill., to Bloomington; M. Donahoe at Bloomington, and H. Kleine at Slater, Mo. R. D. McSmith, master carpenter at Bloomington, has been assigned to other duties, and that office is abolished. E. Gephart, master carpenter at Bloomington, has been appointed supervisor of bridges and buildings of the Northern and Southern divisions, with office at Bloomington. J. T. Martin, master carpenter at Mexico, Mo., has been appointed supervisor of bridges and buildings of the Western division, with headquarters at Mexico.

Purchasing

W. E. LeFaivre has been appointed purchasing agent of the Denver & Rio Grande, with headquarters at Denver, Colo., to succeed Thomas Tipton.

J. F. Hoyer has been appointed purchasing agent of the New Orleans Great Northern, with office at Jackson, Miss., succeeding F. L. Kinsman, resigned.

Special

W. W. Evans has been appointed agricultural agent of the Missouri, Kansas & Texas, with headquarters at Dallas, Tex.

OBITUARY

D. C. Idler, formerly for 40 years master mechanic of the Vandalia, died at Indianapolis, Ind., February 23.

I. I. Spiro, president of the Indiana Transportation Company, died on March 1, at Michigan City, Ind., aged 50 years.

G. D. Hughes, trainmaster of the Denver & Rio Grande at Helper, Utah, died at Salt Lake City on February 28, aged 36 years.

D. Clem Deaver, immigration agent of the Chicago, Burlington & Quincy, died at Omaha, Neb., February 22 of heart failure, aged 49 years.

Arthur M. Richards, formerly for many years division superintendent of the Chicago & Alton at Bloomington, Ill., died at his residence in Chicago on February 26, aged 76 years.

Douglass J. Chase, formerly, from 1878 to 1886, division superintendent and superintendent transportation of the Chicago, Burlington & Quincy, and later for several years general superintendent of the Atchison, Topeka & Santa Fe, died on February 20 at Macon, Ill., aged 78 years.

John C. Stuart, assistant to the president of the Erie, died on March 3, at the Garden City hotel, Garden City, Long Island. Mr. Stuart had been in continued ill health since the latter part of 1912, at which time he suffered a nervous breakdown brought on by overwork in connection with labor troubles of that year, when he served as chairman of the conference committee of managers while at the same time acting as vice-president in charge of operation of the Erie when important operating problems were in hand in connection with plans to double track the line between Salemanca and Chicago. Mr. Stuart was for 20 years in the service of the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha—from 1880 to March 1, 1900. He was chief train despatcher on the West division of the Chicago & North Western from January, 1888, to June, 1890, when he became assistant superintendent of the same division, and two years later was appointed superintendent of the Galena division, which position he held until February, 1898, when he was made general superintendent of the Chicago, St. Paul, Minneapolis & Omaha. In March, 1900, he went to the Baltimore & Ohio as general superintendent of the Middle and North Western divisions, and in September, 1901, was appointed general superintendent of transportation on the same road at Baltimore, Md., leaving that company January 1, 1903, to become general superintendent of the Erie at Cleveland, Ohio. The following year he was appointed general manager, and on November 23, 1909, was elected vice-president of the company. In October, 1913, he resigned as vice-president and was made assistant to the president, but was granted leave of absence because of his failing health.

John Sebastian, who retired on January 1 as third vice-president in charge of passenger traffic of the Chicago, Rock Island & Pacific, owing to continued ill health, died at his residence in Evanston, Ill., on March 1, aged 65 years. A biographical sketch and a photograph of Mr. Sebastian were published in the *Railway Age Gazette* of January 2, page 45. He was born January 28, 1849, at Newport, Ky., and began railway work in 1869 with the Atchison, Topeka & Santa Fe in the general ticket office. He went to the Chicago, Rock Island & Pacific as general southwestern passenger agent in 1880, and was with that road continuously to the date of his retirement, having been third vice-president since December 1, 1909. At the time of his retirement the executive committee adopted resolutions including the following:

J. Sebastian

"John Sebastian, third vice-president of this company, has been in its service thirty-six years, principally in the passenger traffic department. He has labored in divers capacities through the changing conditions of nearly four decades. It has fallen to his lot not only to deal with passenger traffic problems ranging from colonization to the handling of dense suburban traffic, but also to deal with questions of transcontinental rates and of immigration of foreign peoples. In his entire range of duty he has acquitted himself with vigor and honor and it is a source of regret that on account of ill health he finds it necessary to retire from active service."

As a further evidence of appreciation, a material financial recognition accompanied these resolutions.

In addition to the usual activities of his official positions he was the inventor of several railway tickets and mileage books which are the standards of today.

Equipment and Supplies

LOCOMOTIVE BUILDING

The Tampa & Gulf Coast is in the market for motive power.

The Pere Marquette has ordered 5 Pacific type locomotives from the Baldwin Locomotive Works.

The Virginia & Southwestern has ordered one ten-wheel type locomotive from the Baldwin Locomotive Works.

The Missouri, Kansas & Texas is reported to be in the market for 25 locomotives. This item has not been confirmed.

The Missouri & North Arkansas has ordered one ten-wheel type and 3 mikado type locomotives from the Baldwin Locomotive Works.

The Great Lakes Stone & Lime Company, Alpena, Mich., has ordered 5 four-wheel switching locomotives from the Baldwin Locomotive Works.

The Buffalo, Rochester & Pittsburgh has ordered 2 Pacific and 5 Mallet type locomotives from the American Locomotive company. The former will have 24½ by 26 in. cylinders, 73 in. driving wheels, a total weight in working order of 262,000 lb., and will be equipped with superheaters. The latter are of the 2-6-6-2 type. They will have 23½ by 37 by 32 in. cylinders, 57 in. driving wheels, a total weight in working order of 420,000 lb., and will also be equipped with superheaters.

CAR BUILDING

The Tampa & Gulf Coast is in the market for rolling stock.

The Nashville, Chattanooga & St. Louis is in the market for 2 postal cars.

The Virginia & Southwestern has ordered 935 fifty-ton gondola cars from the Pressed Steel Car Company.

The New York Central & Hudson River is in the market for 500 steel automobile cars, 1,000 steel underframe box cars, 1,000 50-ton self-clearing hopper cars and 1,150 hopper bottom gondola cars.

The Missouri Pacific has ordered 83 passenger cars from the American Car & Foundry Company, including 10 for the Denver & Rio Grande.

The Missouri & North Arkansas is said to have ordered 5 caboose and 2 combination mail and passenger cars from the American Car & Foundry Company. This item has not been confirmed.

IRON AND STEEL

The East Broad Top Railroad & Coal Company is in the market for a second hand 70 ft. turntable and about 200 tons of 70-lb. relaying rails.

The Great Northern has ordered 15,000 tons of rails, of which 5,000 tons were ordered from the Illinois Steel Company and the remainder from the Cambria Steel Company and the Lackawanna Steel Company.

The Illinois Central has increased its recent rail order to 67,000 tons, of which 25,000 tons were ordered from the Illinois Steel Company, 20,000 tons from the Tennessee Coal, Iron & Railroad Company and the remainder from various mills.

Railway Construction in Spain.—The government of Spain has recently approved a project for a 111 mile line from Burgos to Ontaneda. The railway is to be constructed in four sections—Burgos to Arconada, 26 miles; Arconada to Monco, 25 miles; Monco to the Cantabrians, 28 miles; and the Cantabrians, to Ontaneda, 32 miles. It is estimated that 57 tunnels of various lengths and 33 bridges will have to be built.

Supply Trade News

D. R. Niederlander has been elected president of the Adreon Manufacturing Company, St. Louis.

Edwin M. Hall, treasurer of the Jefferson Union Company, Lexington, Mass., died on Wednesday, February 11.

The W. J. Baker Nut and Bolt Lock Washer Company, Newport, Ky., has succeded the Universal Nut and Bolt Lock Company, and will continue the manufacture of that company's nut lock on a more extensive scale.

The Westinghouse Church Kerr & Company, 37 Wall street, New York, have established a laboratory for the purpose of testing concrete aggregates, waterproofing materials and paints and preservative coatings for steel and concrete.

The Armspear Manufacturing Company, 447 West Fifty-third street, New York, will be represented in southern territory after March 1 by E. H. Pilson. He will have office at Room 907 in the Woodward building, Washington, D. C.

H. H. Decker, who resigned recently as engineer, maintenance of way, of the Chicago & North Western lines east of the Missouri river, with headquarters at Chicago, has become connected with the Koss Construction Company, general contractors, Des Moines, Iowa, as secretary and treasurer.

William D. Mainwaring, who has been connected with the Detroit plant of the Railway Steel Spring Company of New York, as chemist and metallurgical engineer, has opened a consulting business as production engineer, with offices at 866 Rockefeller building, Cleveland, Ohio.

H. F. Wardwell has been appointed Chicago representative of the Monarch Steel Castings Company, of Detroit, and will handle "Lion" and "Monarch" couplers and miscellaneous open-hearth steel castings in addition to his rebuilt locomotive and car business, with office at 359 Railway Exchange.

John L. Randolph has been appointed eastern sales manager of the Economy Devices Corporation, 30 Church street, New York. Mr. Randolph was born in Boston, Mass., August 25, 1878, attended the public schools and was graduated from the English High School of that city. He began his railroad career as a machinist apprentice in the Concord, N. H., shops of the Northern Railroad, now a part of the Boston & Maine. Subsequently he served this road in the capacity of machinist, gang foreman, general foreman, master mechanic, and superintendent of shops at Keene, N. H In April, 1911, he accepted a position with the Franklin Railway Supply Company in the mechanical department and remained with that company until February 1, 1914, when he was appointed eastern sales manager of the Economy Devices Corporation, as noted above.

J. L. Randolph

F. W. Davis, Jr., vice-president of the Detroit Graphite Company, Detroit, Mich., has been elected president of that company, succeeding A. A. Boutell, deceased. He will have headquarters for the present in New York. T. R. Wyles, second vice-president, has been elected vice-president, succeeding Mr. Davis.

O. P. Wilson, of the purchasing department of the Westing-

house Electric & Manufacturing Company, has resigned to accept the position of assistant general manager of the Norma Company of America, 20 Vesey street, New York, manufacturers and importers of high grade ball bearings, roller bearings, precision instruments, etc.

Scott R. Hayes, whose appointment as assistant to the president of the New York Air Brake Company, New York, was briefly noted in the *Railway Age Gazette* of February 20, was born at Columbus, Ohio, on February 8, 1871. In 1890 he left Cornell University to go with the Thompson-Houston Company, with headquarters at Cincinnati, Ohio. When the General Electric Company was formed in 1892, Mr. Hayes was placed in charge of its Cleveland office and remained in that position until the latter part of 1894. In the following year, 1895-96, he was engaged in the electrical supply business at Cleveland, Ohio, under the firm name of Hayes & Arthur. In 1897 he was appointed agent for the Scott Spring Company, with headquarters at Cleveland, going to Chicago one year later as representative for the company. When the Railway Steel-Spring Company was formed in 1902 he was transferred to the New York office as eastern sales agent, and since that time has been, respectively, general sales agent and vice-president. He resigned from the latter position to take up his new work with the New York Air Brake Company.

S. R. Hayes

Earl A. Averill has resigned as managing editor of the *Railway Age Gazette, Mechanical Edition*, to become engineer of operation of the Standard Stoker Company, Grand Central Terminal, New York. Mr. Averill was born at Richland, N. Y., on August 13, 1878, and after a preparatory education in public and private schools entered Cornell University in 1896. He was graduated in 1900 with the degree of mechanical engineer, having specialized during his senior year in railway mechanical engineering. He began his practical railroad work in the summer of 1899 in the shops of the Philadelphia & Reading, at Reading, Pa., and, on graduation, went with the Chicago, Burlington & Quincy, at West Burlington, Ia., reporting to J. F. Deems, then master mechanic at that point. After four years' service with the Burlington, most of which was in the shop, roundhouse and on the road, Mr. Averill joined the staff of the *Railway and Engineering Review* of Chicago, and remained with that publication for two years. On January 1, 1906, he joined the staff of the *American Engineer and Railroad Journal* as an editor, and on April 1, 1910 became managing editor. He has continued in that position since the purchase of the paper by the Simmons-Boardman Publishing Company. With the Standard Stoker Company, he will have charge of the installing and preliminary operation of the stokers as well as all tests, records of service, etc.

E. A. Averill

Baldwin Locomotive Works

The annual report of the Baldwin Locomotive Works, Philadelphia, Pa., for the calendar year 1913, recently submitted to the stockholders by President Alba B. Johnson, shows that the company's gross sales in 1913 were $37,630,969, a substantial increase over the $28,924,335 of the year before. The manufacturing profit in 1913 was $3,886,475, and the total income $4,673,638. The net profit amounted to $4,017,800, as compared to $3,698,571, or to $1,671,419 for the second half of 1911, the first period of the operations of the present company. Dividends were paid to the amount of $1,400,000, or 7 per cent., on preferred and $400,000, or 2 per cent., on common stock, the same as in 1912. There thus remains an undivided profit of $2,217,800, or a surplus as of January 1, 1914, of $4,887,791, as compared to that of January 1, 1913 of $2,669,990. Including the surplus of the Standard Steel Works Company, a subsidiary, the total is $5,530,159. The gross sales of the latter company were $6,821,594.

Speaking of business conditions, Mr. Johnson says: "During the early part of 1913 orders were received sufficient to provide a satisfactory volume of work throughout the first nine months, but there was a considerable recession of business during the last three months. Whilst the value of orders carried over into 1914 is comparatively small, there appear to be prospects of early improvement."

Chicago Railway Equipment Company

President E. B. Leigh, of the Chicago Railway Equipment Company in his annual report to the stockholders for the fiscal year ending December 31, 1913, discusses business conditions during the year in part as follows:

"Your president's last annual report referred to 1912 as having been a remarkable year; the same may be said of the year just closed. Many of the conditions of 1913, however, were almost the converse of those of 1912.

"In 1912 we experienced a curtailment of business in the early part of the year—followed by a sharp upward trend, and closing with an almost unprecedented volume carried over into 1913. This was further augmented during the first three months of the year, after which our orders rapidly declined. The last half of the year recorded almost the lowest ebb ever known—the number of unfinished orders on hand at the end of 1913 being the smallest of any year, save one—1909.

"The general business, however, maintained a high level almost to the close of the year. Shipments (and consequently business done) continued heavy up to December, even December itself being a fair month. This condition was due to the large volume brought over into 1913, and the business initiated in the early part of the year, plus the accretions during its last half, which latter, although relatively small and steadily declining, were nevertheless a factor in continuing the volume of output. It was this continuing condition of present good business which, in many directions, appeared to obscure the impending and actual falling off of new business, and its inevitable results.

"It is confidently believed that had the Eastern railways been granted the advance in rates asked for June last, such action on the part of the Interstate Commerce Commission would have so restored confidence in railway credit, and encouraged continued railway purchases—at least to the extent necessary to have so reinforced the volume of unfinished business as to have not only very materially increased the business done, but doubtless would have averted the present unsatisfactory condition.

"There are many evidences of a strong optimistic feeling, and while many authorities believe the year 1914 will be a good (and perhaps an exceptionally good) business year; still it is believed that unless the railways are granted the now pending, asked for increase in rates, or some other influence is developed to encourage or stimulate their much needed purchases, this hoped for revival in business is not apt to be realized, or the predicted high point reached."

The balance sheet shows that during the year $174,020 was paid in dividends, making a total of $2,246,211.68 since January 1, 1901; $50,000 was appropriated from earnings and added to reserve account. The real estate, buildings, machinery, plant and equipment are carried in the balance sheet at $1,686,428, the good will and patents at $774,895.34, making the total property account $2,461,324, while the current assets aggregate $1,481,505.76. The capital stock outstanding is $2,486,000.

Railway Construction

CALDWELL COUNTY & SOUTHERN (Electric).—Organized in Missouri with a $100,000 capital, to build from Hamilton, Mo., south to Kingston, about 10 miles. F. L. Bowman, Kingston, and D. Miller, Kansas City, are interested.

CENTRAL WESTERN CANADA.—A bill has been passed by the Canadian parliament incorporating this company with a capital of $8,000,000. The plans call for building from Winnipeg, Man., northwest to Edmonton, Alta., about 800 miles. Pringle & Guthrie, Citizens building, Ottawa, Ont., are the parliamentary agents, in charge of the bill.

CHILDRESS, MANGUM & OKLAHOMA CITY.—A contract has been given to G. H. Parker & Co., of Yorkville, Ill., it is said, to build from Childress, Tex., northeast to Mangum, Okla., 61 miles, and construction work is to be started within 60 days. M. A. Weslow, secretary of the Childress Commercial Club, is a promoter.

COLORADO, KANSAS & OKLAHOMA.—According to press reports this company has given a contract to build an extension from Garden City, Kan., south to Scott City. It is understood that the construction of a line to connect the Wichita Falls & Northwestern at Forgan, Okla., with the C. K. & O. extension is now assured.

GREENSBORO, NORTHERN & ATLANTIC.—An officer of this company, which was organized some time ago, writes that the prospects of building the line are good, but that it has not yet been decided when bids will be asked for the work. The projected route is from Danville, Va., south via Burlington, N. C., to Granham, about 35 miles, with an east and west line from Greensboro, N. C., east to Durham, about 50 miles. The work will involve handling about 30,000 cu. yds. to the mile. The line is to have maximum grades of 1 per cent. and maximum curvature of 6 degrees. There will be three steel viaducts and a number of station buildings on the line. T. O. Troy, president; W. Washabaugh, chief engineer, both of Charlottesville, Va.

INTERCOLONIAL.—An officer writes regarding the report that double tracking work was to be carried out on 50 miles between Halifax, N. S., and Moncton, that this has not yet been authorized, but surveys are being made in connection with this work.

KANSAS ROADS.—Plans are being made to build a line from Arkansas City, Kan., northeast to Olathe, about 200 miles. A. Powell, Enid, Okla., is said to be interested.

MADISON & JANESVILLE TRACTION.—Incorporated in Wisconsin with $25,000 capital, to build a line connecting Beloit, Wis., with Elkhorn, Whitewater, Janesville and Madison. F. H. Weston, Madison, is an incorporator.

MAINE ROADS.—A 15-mile line may be built to Bald Mountain to develop timber land owned by Perry & Whitney, Boston, Mass.

MEXICAN ROADS.—According to press reports from the City of Mexico, a concession has been given by the Mexican government to Charles Hamilton, representing a number of French and Belgian capitalists, to build from the port of Acapulco, on the Pacific coast, to Oaxaca, in the state of the same name. The proposed line will open up the petroleum and coal deposits of the Pochutla district of Oaxaca.

MINNEAPOLIS, MERRILL & MARINETTE.—The Railroad Commission of Wisconsin has granted a certificate of convenience and necessity to this company, it is said, authorizing the construction of this line. The company expects to let contracts this spring to build from Merrill, Wis., southwest to a point near Athens, about 25 miles. John O'Daly, president, Merrill. (January 23, p. 209.)

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has awarded the contract for the construction of Section 2 of the Jerome avenue extension of the Lexington Avenue subway to the Cooper & Evans Company, the lowest bidder, for $1,076,831. This will be a three-track subway from One Hundred and Eighty-second street along Jerome avenue to Woodlawn road. (February 20, p. 407.)

Bids will be opened by the commission on March 27 for the section of the Eastern Parkway, in the borough of Brooklyn, from the present terminus of the subway to Buffalo avenue.

OREGON-WASHINGTON, RAILROAD & NAVIGATION COMPANY.—Construction work is to be started soon on a cut-off from a point on the main line just west of Echo, Ore., west to Coyote on the Columbia river, about 35 miles. The cut-off will be 9.4 miles shorter than the existing line, and will eliminate 1,560 deg. of curvature and 174 ft. of adverse grades.

An officer writes that this company has been investigating traffic possibilities of an extension from Condon, Ore., southward, and has made some surveys, but no conclusion has yet been reached to start construction work on such an extension.

PENNSYLVANIA RAILROAD.—The report of this company for the year 1913 shows that the work is satisfactorily progressing on the eastern section of the six track system for the New York division between Colonia, N. J., and Waverly, including the elimination of 15 grade crossings by the elevation of the four existing main tracks and the construction of two elevated tracks. Two eastbound tracks are now in operation and grading and masonry for two more tracks will be completed soon. The two remaining tracks, it is expected, will be finished by the end of 1914. The passenger facilities in and around Philadelphia, Pa., have been improved during the year. On the Connecting Railway, two tracks of the new bridge over the Schuylkill river and approaches at Girard avenue, Fairmount Park, have been placed in operation. The old bridge is being removed and masonry for three additional tracks will be completed during 1914. Work on the enlargement of the North Philadelphia station is under way. The work of improving the grades and alinement and double tracking between Pittsburgh, Pa., and Buffalo, N. Y., via the Allegheny division and the Western New York & Pennsylvania Railway is proceeding satisfactorily, and it is expected that the three tunnels at East Brady, Wood Hill and Kennerdell, which are being constructed as part of this improvement, will be completed in 1914. The changes of alinement and grade between Kiskiminetas Junction and Freeport on the Conemaugh division, including a double track bridge over the Allegheny river, are under way, and changes of grades and elimination of grade crossings at Homewood avenue, Pittsburgh, and in the borough of Wilkinsburg, are in progress. The grade crossing elimination work in the borough of Braddock was completed during the year. Under an agreement with the city officers of Philadelphia, Pa., for the elimination of grade crossings, the Pennsylvania will be required to elevate and relocate the present running tracks, yards and facilities on a portion of the Delaware extension, with its Girard Point and Schuylkill River branches from the Arsenal bridge over the Schuylkill river to Delaware avenue and Queen street, and use instead the new tracks of the Delaware extension when elevated between the Arsenal bridge and Twenty-fifth and McKean streets, and a new two track elevated line extending along Point Breeze avenue, Twenty-ninth street and the Back Channel north of the League Island Navy Yard to a terminal yard to be located between Broad street and the Delaware river, from which point the line will remain at grade along the north side of said yard and on Delaware avenue to Bigler street, and the present tracks and facilities on that avenue will be relocated as far north as Queen street. The Baltimore & Ohio will likewise relocate and elevate its present tracks on a new location adjoining the relocated tracks of the Pennsylvania, from Passyunk avenue to and along Delaware avenue. This portion of the line will be operated as a joint four track railroad, with provision for its use as a belt line. The tracks of the Philadelphia, Baltimore & Washington, along Washington avenue, will also be elevated as a three track railroad to Broad street, and as a double track line east thereof. It is expected that this work will be finished within five years. Satisfactory progress is also being made on the New York Connecting Railroad, owned jointly by the Pennsylvania Railroad and the New York, New Haven & Hartford, now building from a connection with the Long Island Railroad, thence through the borough of Queens and over the East river and Randall's and Ward's islands to a connection with the N. Y. N. H. & H., near Port Morris in the borough of the Bronx, New York City.

SASKATOON & HUDSON BAY.—Application is being made in Canada for an extension of time to build from Saskatoon, Sask., northeasterly to Melfort, thence northeasterly to Pas,

Man., about 200 miles. V. T. Bartram, a contractor, of Toronto, Ont., is interested in the project, and C. G. Locke, Saskatoon, Sask., is solicitor for applicants.

SOUTHERN ILLINOIS RAILWAY & POWER COMPANY.—An officer writes that under the name of the Southern Illinois & St. Louis a line is to be built from Harrisburg, Ill., west to Marion Junction then southwest to Marion. From Marion Junction the line is to be extended north via Johnson City and West Frankfort to Benton, with a short line west from Johnson City to Herrin. There will be 50 miles of main line and 10 miles of sidings, passing tracks and yards. Grading contracts will be let in April. The work involves handling an average of about 12,000 cu. yd. to the mile. The maximum grades will be 0.7 per cent., except on about 2,000 feet out of Johnson City, where there will be a 2 per cent. grade. The maximum curvature will be 5 degrees, with 18 degree curves entering yards and at special points. There is to be one 320-ft. steel bridge and a number of steel or concrete span varying in length from 30 to 60 ft. each. The company plans to put up car shops, two sub-stations, and five combination passenger and freight stations. The line will traverse a coal section in Saline, Williamson and Franklin counties, and the company expects to develop a heavy passenger and freight traffic. W. H. Schott, president and treasurer, Chicago. (February 20, p. 407.)

SOUTHERN ILLINOIS & ST. LOUIS.—See Southern Illinois Railway & Power Company.

SOUTHERN RAILWAY.—It is understood that part of the funds from a recent note sale will be used to complete the Stevenson extension, on which work was suspended in 1908. This line has been graded from Chattanooga, Tenn., to Stevenson, Ala., and piers for a bridge across the Tennessee river, just above the Hale's bar lock and dam, have been completed for some time. The tunnel throughout Lookout mountain has also been completed.

TAMPA & GULF COAST.—An officer writes that the plans call for building a total of about 100 miles through the west coast fruit section of Florida, touching the Gulf of Mexico at Port Richey, Tarpon Springs and Clearwater, and extending to St. Petersburg around Old Tampa bay. Grading work and track laying are now under way by company forces, and it is expected that the work will be finished to St. Petersburg by September of this year. The line will have maximum grades of 0.5 per cent. and easy curves. There will be a number of trestles, including some as long as 1,500 ft. The company expects to develop a traffic in citrus fruit, merchandise, fertilizer and hard rock. The company has finished work on about 28 miles and now operates 22 miles from Tarpon Springs east to Lutz Junction. (February 20, p. 407.)

WICHITA FALLS & NORTHWESTERN.—See Colorado, Kansas & Oklahoma.

WILLIAMSPORT, NESSLE & MARTINSBURG.—This company, which was incorporated last year with $250,000 capital, and principal office at Martinsburg, W. Va., has surveys made from Williamsport, Md., southwest to Martinsburg, W. Va., about 15 miles.

WINDFALL & CENTRAL INDIANA TRACTION.—Incorporated in Indiana with $10,000 capital and headquarters at Windfall, to build from Tipton, Ind., northeast via Windfall to Marion. E. N. Todd is a director.

RAILWAY STRUCTURES

HANNIBAL, MO.—Both houses of Congress have passed a bill authorizing the Missouri, Kansas & Texas to construct a bridge across the Mississippi river near Hannibal.

MILWAUKEE, WIS.—The Chicago & North Western has begun preliminary work in connection with the proposed new passenger station. Most of the work to be done this year will be the filling in of the lake shore.

SAN ANTONIO, TEX.—The Missouri, Kansas & Texas has announced its intention of beginning work soon on the construction of a large passenger station.

TORONTO, ONT.—The Canadian Pacific is planning to replace all the wooden bridges on the line between Toronto and Windsor with steel and stone structures, it is said, this coming summer.

Railway Financial News

CHESAPEAKE & OHIO.—This company has sold to Kuhn, Loeb & Company and the National City Bank, both of New York, $33,000,000 5 per cent. 5-year notes. From the proceeds of the sale of these notes the company is to retire at maturity on June 1, $28,500,000 notes, of which $25,000,000 are 3-year 4½ per cent. notes and $3,500,000 1-year 5 per cent. notes. The Chesapeake & Ohio has no other securities maturing before 1929.

CHICAGO, ROCK ISLAND & PACIFIC.—For comments on the reorganization of the holding companies see editorial pages.

The following have formed themselves into a protective committee for the stockholders of the Rock Island Company (the holding company): William A. Read, A. C. James, William Charles Osborn, Ogden Mills, Francis L. Hine, A. J. Miller and Benjamin Strong, Jr.

A committee has been formed to protect the interests of the collateral trust 4 per cent. bonds as follows: James Brown, of Brown Brothers & Co., New York; B. M. Baruch; Henry Evans, president of the Continental Insurance Co.; Frederick Strauss, of J. & W. Seligman & Co., and James N. Wallace, president of the Central Trust Company.

ERIE.—This company has sold to J. P. Morgan & Co., New York, $13,500,000 5½ per cent. 3-year notes, of the proceeds of which $12,500,000 will be used to pay 3-year 6 per cent. notes, due April 8, and the remainder to pay off miscellaneous bank loans. The company will have no more maturing obligations until October 1, when $4,550,000 notes are due.

FLORIDA, ALABAMA & GULF.—W. N. Roberts, of Pensacola, Fla., has been made receiver in a suit brought by the trustee of bondholders.

MICHIGAN CENTRAL.—This company has sold to J. P. Morgan & Co., New York, who have resold, $6,000,000 4½ per cent. notes. Of the proceeds of this sale $4,000,000 will be used to pay off maturing 4½ per cent. notes and the remainder is to be used for improvement work on the Michigan Central and on the Detroit river tunnel.

ST. LOUIS SOUTHWESTERN.—This company has had the authority of the Missouri railroad commission to issue $1,234,000 improvement mortgage bonds.

SOUTHERN PACIFIC.—The Texas State Court of Civil Appeals has held that the Galveston, Houston & San Antonio terminals at El Paso, Tex., belong to this subsidiary of the Southern Pacific. Certain citizens of El Paso have brought suit to compel the forfeiture of title because of a claim that the property had been abandoned for railroad purposes. The court held that since trains are stopped at this station as well as at the Union station the property had not been abandoned.

Robert N. Lynch, general manager of the San Francisco Chamber of Commerce, has issued a long statement regarding the dissolution of the Southern Pacific-Central Pacific which it is rumored that Attorney General McReynolds intends to seek through a suit under the Sherman law. This statement claims that the very great majority of citizens of California who are interested in the California railroad situation, either as shippers or as passengers, are strongly opposed to a dissolution suit. It is claimed that California, Oregon and Nevada will also join in the protest.

UNION TERMINAL COMPANY (Dallas, Tex.).—This company has sold to William Salomon & Co., New York, $2,000,000 bonds.

WABASH.—It is said that under the plan of reorganization now under consideration new adjustment income of the reorganized company will be exchanged for present first and refunding 4 per cent. bonds on the basis of 110 of new adjustments for 100 old bonds. The adjustment bonds will bear interest at 5 per cent. cumulative. Preferred stockholders under the proposed plan are to be assessed $20 per share and receive 95 per cent. of their par value in new stock of the reorganized company. Common stockholders will be assessed $20 per share and will receive 83 per cent. of their par value in new stock.

[ADVERTISEMENT.]

ANNUAL REPORT.

THE PENNSYLVANIA RAILROAD COMPANY—SIXTY-SEVENTH ANNUAL REPORT

GENERAL OFFICE, BROAD STREET STATION, PHILADELPHIA, February 25th, 1914.

The Board of Directors submit herewith to the Stockholders of The Pennsylvania Railroad Company a synopsis of their Annual Report for the year 1913:—

Rail operations—Revenues		$185,400,825.37
Rail operations—Expenses		137,987,400.85
Net revenue—Rail operations		$47,413,424.52
Auxiliary operations—deficit		1,904,281.08
Net Railway operating revenue		$45,509,143.44
Railway tax accruals		7,326,660.27
Railway operating income		$38,182,483.17
Other income:		
Income from securities, accounts and sinking and other reserve funds	$16,934,160.61	
Rent income, etc	2,596,254.88	19,530,415.49
Gross income		$57,712,898.66
Deductions from gross income		15,792,065.87
Net income		$41,920,832.79
Disposition of net income:		
Appropriations to sinking and other reserve funds	$1,882,775.06	
Cash dividends	28,394,247.75	
Appropriations for Additions and Betterments	9,287,582.36	
Construction expenditures on branch roads.	1,815,624.61	$41,380,229.78
Balance transferred to credit of Profit and Loss		$540,603.01

CONDENSED GENERAL BALANCE SHEET.

DECEMBER 31st, 1913.

ASSETS.		
Property investment:		
Road	$301,864,185.35	
Equipment	180,272,348.06	
	$482,136,533.41	
Reserve for accrued depreciation—*Cr.*	15,426,512.87	
		$466,710,020.54
Securities owned		333,960,824.59
Securities under lease of U. N. J. R. R. & C. Co.		2,559,658.25
Miscellaneous investments		2,088,351.70
Cash		30,267,604.95
Materials and supplies		17,701,769.64
Cash and securities in sinking, insurance and other reserve funds		33,989,309.91
Cash and securities in provident funds		7,917,069.67
Other assets		44,977,101.38
		$940,171,710.63
LIABILITIES.		
Capital Stock		$499,233,850.00
Stock Allotment, 1913, Receipts Full Payment		31,895.00
Premium realized on Capital Stock from January 1st, 1909.		7,196,676.75
Funded Debt of The Pennsylvania Railroad Company		142,558,100.00
Funded Debt of Companies whose properties have been acquired by The Pennsylvania Railroad Company		58,889,500.00
Guaranteed stock trust certificates, Philadelphia, Wilmington and Baltimore Railroad and New York, Philadelphia and Norfolk Railroad Companies		14,547,250.00
Equipment trust obligations		29,554,908.80
Mortgages and ground rents payable		3,352,443.28
Securities received with the lease of the U. N. J. R. R. & C. Co.		2,559,658.25
Liability on account of provident funds		7,917,069.67
Other liabilities		40,098,974.62
Additions to property since June 30th, 1907, through income		66,137,086.06
Reserves from income or surplus:		
Invested in sinking, redemption and other reserve funds		35,104,815.55
Reserve for additions and betterments and car trust principal charged out in advance		3,962,301.99
Profit and Loss		29,027,180.66
		$940,171,710.63

The number of tons of freight moved on the five general divisions east of Pittsburgh and Erie in 1913 was 152,503,355, an increase of 9,022,924, or 6.29 per cent.; the number of passengers was 77,968,204, an increase of 5,515,317, or 7.61 per cent.

The number of tons of freight moved on the lines west of Pittsburgh was 174,797,620, an increase of 9,347,838. The number of passengers carried was 35,593,648, an increase of 1,267,267.

The operating revenue of all lines east and west of Pittsburgh for the year 1913 was $392,484,210.11, operating expenses, $321,500,590.28, and operating income, $70,983,619.83, an increase in operating revenue, compared with 1912, of $18,388,030.19, and a decrease in operating income of $11,245,181.28. There were 504,860,705 tons of freight moved on the entire system, being an increase of 29,076,819 tons, and 190,572,041 passengers carried, an increase of 11,509,476.

The Railroad Companies east of Pittsburgh and Erie in which your Company is interested show satisfactory results. Detailed statements of their operations will be found in their respective annual reports, as well as in the full report of your Company.

There were expended during the past year for construction, equipment, and real estate on the Lines West of Pittsburgh $22,824,473.86.

The expenditures were principally for the elevation of tracks in Cleveland, Fort Wayne, and Chicago, the construction of additional main tracks on the Pittsburgh, Fort Wayne and Chicago Railway, the Cleveland and Pittsburgh Railroad, the Toledo, Columbus and Ohio River Railroad, and the Pittsburgh, Cincinnati, Chicago and St. Louis Railway, increase in yard and station facilities at various points, and for additons to and improvement of the equipment.

GENERAL REMARKS.

The mileage of the lines directly operated was increased 12.03 miles, due chiefly to the construction of various branch lines to obtain additional traffic, and the changes in the mileage owned and that operated under lease or as agent are due to the absorption of the Cambria and Clearfield Railway.

The total revenues from rail operations exceed those of any previous year in the history of the Company, being 6.18 per cent. greater than the revenues in 1912, but a downward tendency occurred in the last two months of the year.

While the revenues increased 6.18 per cent., the total expenses of Rail Operations show an increase of 8.96 per cent. compared with the previous year.

The operating results of the year 1913 like those of 1912 were affected by legislation such as the Extra Crew Laws and other expensive measures, and by wage increases granted as the result of arbitration under the Erdman Act. The Extra Crew Laws alone involved an expenditure by the Pennsylvania Railroad System East of Pittsburgh and Erie of $850,000 in round figures, and this will convey some conception of the extent of the needless expenditures that have been placed upon all of the railroads in this territory. During 1913 the conductors and trainmen on forty-one of the railroads in Eastern territory comprising about 100,000 men, submitted a request to the various carriers for an increase in wages, in which your Company and others could not acquiesce. The matter was finally submitted to arbitration, being the first wage controversy to be settled under the new Federal Law known as the Newlands Act, with the result that working conditions were further restricted, and an increase in wages was granted approximating for all railroads concerned, about $6,000,000 per annum, or 7 per cent. This award was made November 10th, 1913, effective October 1st, 1913, but the increased wages have not yet been paid as further interpretations of the award are now being made and settlement will follow. The expenses for the year 1914 will be increased approximately $730,000 as the result of this award.

It is evident therefore that the ability to regulate wages and working conditions, and other heavy operating expenses has, as the result of Federal and State Legislation, largely passed from the control of your Management, as has also the power of your Company and other railroads, to charge reasonable rates for the public transportation service rendered. The gravity of the situation is indicated in the following quotation from the recent award of the Board of Arbitration in the matter of conductors' and trainmen's wages:

"This Board has no authority to determine the passenger and freight rates to be paid in the Eastern Territory; neither is it in a position to determine whether such an increase is justified, as a matter of fact, by all of the circumstances. This Board, however, believes that it must make its finding as to what is a proper rate of pay to be awarded to the conductors and trainmen as a result of this arbitration, without any reference to the dilemma in which the railroads are evidently placed by the laws which make it impossible for them to increase passenger and freight rates without the authority of the Interstate Commerce Commission or of the Railroad Commissions of the various States. To take any other view of the question would be to decide that no increase of pay, while the laws remain as they are, can ever be made except voluntarily by the railroads. Such a decision would render arbitrations like this, valueless; and it would be in effect to hold that railroad service in the Eastern Territory must continue to be rendered at existing rates of pay, even though this were to condemn the employes of the railroad to work for rates of pay which have been determined by the most careful inquiry to be inadequate. At the present time a ton of freight is moved in the Eastern Territory more than three miles for the value of a two-cent postage stamp. This is the cheapest railroad service to the shipper to be found on the face of the globe. In the face of such a fact, it would be unjust to say that railroad employes must continue to be satisfied only with what can be paid from freight rates as low as this. The Interstate Commerce Commission, and not this Arbitration Board, has the duty of determining whether the railroads can earn in addition to their other charges, without an increase of freight rates, the rates of pay that this Board believes to be due at the present time to the conductors and trainmen, which rates are embodied in the Award following."

It is difficult to escape the conclusion that some way must be found whereby the serious but divided responsibility of Governmental regulation of rates, wages, and other railway matters shall either be concentrated under one administrative branch of the Government, or the results of Legislative Acts, orders of Commissions, and awards of Arbitration Boards shall be recognized by Rate Regulatory Commissions, so that regulation of wages, rates and other matters may continue without working a manifest injustice to the railroads, and those who have invested in their securities.

The increase in the total expenses for Rail Operations was for the foregoing reasons in greater ratio than the increase in revenue, so that the Net Revenue from Rail Operations decreased $556,229, notwithstanding

the increased efficiency and the larger investment for Railroad and Equipment.

The Net Railway Operating Revenue, as a whole, decreased 2.80 per cent., and adding thereto the increase in Railway Taxes of $198,125, the Railway Operating Income decreased $1,510,650, or 3.81 per cent. as compared with the previous year.

Dividend Income increased due principally to a higher return on the Capital Stock of the Southern Pacific Company, than on your holdings of Baltimore and Ohio Railroad Company Common and Preferred Stocks, which were exchanged therefor, and to which reference is hereafter made; also to the larger income received from your holdings of Norfolk and Western Railway Company securities. Income from Sinking and Other Reserve Funds increased $536,269, which is explained by the fact that only six months' income was included in this item in 1912, under the Interstate Commerce Commission classification which became effective July 1, 1912, while 1913 contains a full year's income.

Hire of Equipment (credit balance) shows a decrease of $802,685 compared with the previous year, due to the use of an increased number of foreign freight cars and the higher per diem rate changed therefor.

Deductions for Lease of Other Roads decreased $1,326,486, due to lower Net Earnings or roads operated on that basis, including the Cambria and Clearfield Railway to March 31, 1913, when it was acquired by your Company.

The Net Income for 1913 was $41,920,833, a decrease of $233,131 compared with 1912, from which appropriations were made to the Sinking and other Reserve Funds; Additions and Betterments were provided for Lines owned, leased and operated; cash dividends amounting to six per cent. were paid; $2,500,000 was transferred to the Reserve for future Additions and Betterments and $540,603 credited to Profit and Loss.

In view of the steady increase in expenses, taxes and other necessary outlays which has caused a continued decrease in the return on its investment in the Railroad and Equipment provided for public service so that the return is inadequate, your Company and other Eastern Railroads, in May, 1913, petitioned the Interstate Commerce Commission to grant permission to advance freight rates on the basis of five per cent. with reasonable minima and with the modifications necessary to preserve existing differential relations between communities, thereby supplementing the petition made in 1910 for an increase in freight rates which the Commission decided not to grant, but upon the understanding that "if actual results should demonstrate that their forecast of the future proved incorrect, there might be ground for asking a further consideration of the subject." The Commission has instituted proceedings on its own initiative to determine whether the present rates of transportation yield adequate revenues to the common carriers affected, and if not, what general course the carriers may pursue to meet the situation. In order to develop the whole situation your Company has in co-operation with other carriers, submitted extensive data relating to the investment in railroad and equipment, earnings, cost of operation, income, etc., for the last sixteen years, in addition to which the officials of your Company are prepared to submit further evidence in support of the general exhibits which will emphasize the necessity for your Company to obtain higher rates. The Commission has also ordered the carriers to furnish extensive information relating to various features of operation and traffic and the relation of the carriers and its employes and officials with respect to contracts for purchase of material and other arrangements, and prompt compliance is being made to this request. While there is no objection to furnishing the additional information desired, beyond the great delay and expense involved, the serious aspect of the situation at the present time is, that no immediate decision may be expected if all the features involved in the Commission's inquiries are to be considered and determined before action is taken upon the important question at issue, and meanwhile railroad revenues are rapidly declining. If, however, these inquiries and the information furnished in response thereto can be made a matter of subsequent investigation, and earlier determination of the entire question is possible; in fact as the Commission, through the uniform accounting system in effect since 1907, supplemented by special investigations and the work of its own examiners, has full information as to the inadequate return earned by the railroads on the capital invested in railway lines and equipment, there would seem to be no substantial barrier against immediately granting the very small measure of relief sought in the application and so urgently needed.

The Capital Stock was increased over the previous year by $45,355,900, under authority given by Stockholders on March 24, 1911. The issue of stock was made on the basis of granting to Stockholders of record May 5, 1913, the privilege of subscribing at par to the extent of 10 per cent. of their holdings.

On February 1, 1914, over 89,000 Stockholders were recorded on the books of your Company, and the average holding was 112 shares each.

The Funded Debt and Equipment Trust Obligations were reduced as follows:

By Redemptions through Sinking Funds	$327,840.00
By Payments at Maturity	14,920,419.16
By Purchase and Cancellation	113,179.08
Total	$15,361,438.24

The railway, property and franchises of the Cambria & Clearfield Railway Company were acquired under authority granted by the stockholders, subject to the outstanding funded debt of	$4,555,000.00
Equipment Trust Obligations on account of Pennsylvania R. R. Co. were issued amounting to	12,851,500.25
Total	$17,406,500.25
Net Increase	2,045,062.01

The total issues of Equipment Trust Securities during the year for all lines consisted of $19,700,000 of Pennsylvania General Freight Equipment Trust Certificates of 1913, of which the Pennsylvania Railroad Company's proportion was $12,851,500.25.

During the year final payments were made under twelve series of equipment trusts, the original issue of which amounted to $12,000,000.

On July 1st, 1913, the bonds of the Harrisburg, Portsmouth, Mt. Joy and Lancaster Railroad Company, of which your Company is the lessee under a 999 year lease, having matured, were extended for an additional period of thirty years, bearing interest at the rate of four per cent. per annum, the principal and interest being guaranteed by your Company in accordance with the terms of the lease.

In order that the Company may have a broad basis for future financing, the stockholders will be asked to approve of the creation by the Board of Directors of a Mortgage under which bonds may be issued in such amounts and at such times as may be required to refund or pay off at or before maturity any obligations of the Company, or obligations of companies whose properties were acquired subject thereto; to provide for necessary additions, betterments and improvements to the railroad lines, equipment, property and facilities, and for any and all other lawful and proper corporate purposes, but no bonds shall be issued for any purpose without the prior consent of the stockholders and the aggregate amount of bonds that may be issued and outstanding thereunder at any time shall not exceed the then outstanding Capital Stock. The Company has no large necessities requiring immediate financing, but it desires to be in a position to provide for its future refunding and capital requirements either by the issue of bonds under the proposed new Mortgage, or under its Consolidated Mortgage, or through the issue and sale of Capital Stock, or by such other form of financing as at the time your Board of Directors shall deem most advantageous to the Company in view of the monetary conditions then prevailing.

The work is satisfactorily progressing on the eastern section of the six-track system for the New York Division between Colonia, N. J., and Waverly, N. J., including the elimination of fifteen grade crossings by the elevation of the four existing main tracks and the construction of two elevated tracks. Two eastbound tracks are now in operation, and grading and masonry for two more tracks will shortly be completed and the additional tracks placed in service. The two remaining tracks, it is expected, will be finished by the end of 1914, thus completing the work between Colonia and Elizabeth.

The passenger facilities in and around Philadelphia have been improved during the year as follows: The concourse in Broad Street Station was enlarged; on the Connecting Railway two tracks of the new bridge over the Schuylkill River and approaches thereto, at Girard Avenue, Fairmount Park, were placed in operation during the year. The old bridge is being removed and masonry for three additional tracks will be completed during 1914, thus making a five track reinforced concrete and stone arch bridge at this point. The enlargement of the North Philadelphia Passenger Station is progressing, the platforms and shelters on the part of the station used for the Chestnut Hill Branch, and the inbound New York Division high level island platforms, with the adjoining tracks now being in operation. For the expenditures made as lessee, on the Connecting Railway for this and other work your Company has been repaid by the issue of the stocks and bonds of the Connecting Railway Company, guaranteed by your Company.

To relieve congestion by increasing the yard and track capacity at Broad Street Station, Philadelphia, the electrification of the Main Line to Paoli, for suburban passenger trains, is under way, and will be followed by the electrification of the New York Division to North Philadelphia and thence to Chestnut Hill. About one mile of overhead construction on the Main Line has been completed between Radnor and St. Davids which will enable the Company to decide by actual tests the type of overhead construction best adapted to its train service.

The work of improving the grades and alignment and double tracking between Pittsburgh and Buffalo, via the Allegheny Division and the Western New York and Pennsylvania Railway, is proceeding satisfactorily, and it is expected that the three tunnels at East Brady, Wood Hill and Kennerdell, which are being constructed as part of this improvement, will be completed in 1914.

The changes of alignment and grades between Kiskiminetas Junction and Freeport on the Conemaugh Division, including a double track bridge over the Allegheny River are under way.

The changes of grades and elimination of grade crossings at Homewood Avenue, Pittsburgh, and in Borough of Wilkinsburg, are in progress, and the grade crossing elimination work in the Borough of Braddock was completed during the year.

The aggregate expenditures for construction and equipment during the year upon the owned and leased lines of this company was $41,434,415.06, for which the Company has been reimbursed by leased lines to the extent of $1,661,074.08. The sum of $1,815,624.61 was expended on the Western New York and Pennsylvania Railway and other branch roads and charged against Income. The expenditures on the lines owned including $2,369,687.70 on the leased lines, viz., Harrisburg, Portsmouth, Mt. Joy and Lancaster Railroad and the lines of the United New Jersey Railroad and Canal Company, comprising the main line system between New York and Pittsburgh amounted to $37,957,716.37 which has been disposed of as follows:—

Charged to Income	$6,387,325.11
Charged to Reserve for Additions and Betterments	6,347,432.63
Charged to Capital Account	25,222,958.63

In keeping with the policy of your Company to promote efficiency and economy in operations, the Management has been considering the advisability of electrifying that portion of the Main Line between Altoona at the foot of the eastern slope, and Conemaugh on the western slope of the Allegheny Mountains, a distance of about thirty-five miles, where there is a frequent and heavy train movement over heavy grades. From preliminary estimates it would appear that a saving could be effected which would compensate the Company for making the expenditure, but the subject must still receive much further examination, and is also largely dependent upon an improvement in the revenues of the Company to warrant raising the new capital required for this project.

In the City of Philadelphia the greater portion of your lines are constructed above or below the streets, except in the southern section of the City, between the Delaware and Schuylkill Rivers. The necessity for the development of several square miles in this section of the City, including the improvement of conditions along the river front, caused the municipal authorities to decide upon the elimination of nearly all existing grade crossings of your railroad, and of the line of the Philadelphia, Baltimore and Washington Railroad and of the Baltimore and Ohio Railroad Companies, and in asking the railroads to co-operate, the City has agreed to bear an equitable share of the large expenditures. Under this arrangement this Company will be required to elevate and relocate the present running tracks, yards and facilities on the portion of the Delaware Extension, with its Girard Point and Schuylkill River Branches, from the Arsenal Bridge over the Schuylkill River to Delaware Avenue and Queen Street, and use in lieu thereof the new tracks of the Delaware Extension when elevated between the Arsenal Bridge over the Schuylkill River and Twenty-fifth and McKean Streets, and a new two-track elevated line extending generally along Point Breeze Avenue, Twenty-ninth Street, and the Back Channel north of the League Island Navy Yard to a terminal yard to be located between Broad Street and the Delaware River, from which point the line will remain at grade along the north side of said yard and on Delaware Avenue to Bigler Street, and the present tracks and facilities on that Avenue will be relocated as far north as Queen Street. The Baltimore & Ohio Railroad Company, which will likewise relocate and elevate its present tracks in that section of the City, will occupy a new location adjoining the relocated tracks of your Company, from Passyunk Avenue to and along Delaware Avenue. This por-

tion of the line will be operated as a joint four-track railroad, with provision for its use as a belt line. Under this agreement the tracks and facilities of the Philadelphia, Baltimore and Washington Railroad Company along Washington Avenue will also be elevated as a three-track railroad to Broad Street, and as a double-track line east thereof. It is expected that this important project will be completed in five years, as and when the City and the Railroad Companies provide the funds requisite therefor.

The construction of the New York Connecting Railroad, owned jointly by this Company and the New York, New Haven and Hartford Railroad Company, and fully described in previous annual reports is satisfactorily progressing, and it is expected will be completed by the Summer of 1916.

The increasing traffic on the Chautauqua Branch between Buffalo and Oil City on the line of the Western New York and Pennsylvania Railway, has, in connection with similar improvements on your Allegheny Division, necessitated the revision of grades, and alignment and longer passing sidings. During the year $1,602,036.12 was advanced to the Western New York and Pennsylvania Railway by this Company to meet its Construction and Equipment expenditures, which sum was charged against the net income of the Lessee Company.

It has been deemed advisable to absorb the Hollidaysburg, Bedford and Cumberland Railroad Company, which is owned and operated by this Company in connection with its main line. The necessity for maintaining that Company as a separate corporation no longer exists, and the agreement providing for its acquisition will, in accordance with the notice given to the stockholders, be submitted for approval at the annual meeting.

During the year your Company made advances to the Long Island Railroad Company aggregating $4,500,000, for the improvement of its railroad and facilities, and the construction of new lines and equipment, for which it will receive securities of that Company.

In accordance with the policy heretofore announced as to the proposed sale of this Company's security holdings in the anthracite coal companies owning properties served by its System, namely, the Susquehanna Coal Company, Mineral Railroad and Mining Company and the Summit Branch Mining Company, your Board deemed it desirable to first compact the ownership of the securities and properties of these coal companies into the Susquehanna Coal Company. Therefore, there has been sold to the Susquehanna Coal Company the Capital Stock and debt of the Summit Branch Mining Company, held by your Company, and upon the transfer of its property and rights to that Coal Company, the Summit Branch Mining Company will be dissolved. Your Company is also the owner of one-third of the Capital Stock of the Mineral Railroad and Mining Company, the balance being owned by the Northern Central Railway Company. That Company operated lands leased from the Northern Central Railway Company and from the Manor Real Estate and Trust Company, but being unable for many years to pay the prescribed royalties, it transferred its 999 year leases to the Susquehanna Coal Company, effective January 1st, 1914, and steps have been taken looking to the dissolution of the Mineral Railroad and Mining Company. The lands of the Manor Real Estate and Trust Company, operated by the Mineral Railroad and Mining Company, have been sold to the Susquehanna Coal Company, and negotiations concluded for the sale to it of the other lands operated by the Mineral Railroad and Mining Company for the Northern Central Railway Company subject to fixing the final price. Under the foregoing arrangement payment for said lands will be made by the Susquehanna Coal Company in its Five Per Cent. Five Year Gold Bonds, which are exchangeable for its First Mortgage Bonds if and when the same are issued by that Company.

The purpose of vesting the ownership of these properties in the Susquehanna Coal Company is to insure the continued operation of the unprofitable as well as the profitable mines, and thereby conserve the coal supply and so that should a purchaser be found for the securities of the Susquehanna Coal Company, held by your Company and the Northern Central Railway Company, the new owners will obtain possession of the properties subject to these mining obligations.

The Company has for some years desired to sell the balance of its holdings of Common and Preferred Stocks of the Baltimore and Ohio Railroad Company, consisting of 57,250 shares of the Common Stock and 142,736 shares of the Preferred Stock, having a total par value of $19,998,600. The foregoing shares represent less than one-half of your original ownership in that Company, and they have been retained since 1906 only as an investment awaiting a favorable opportunity for their disposition. Therefore, when an offer was made to exchange them for 171,438 shares, par value $17,143,800, of the Capital Stock of the Southern Pacific Company, on which six per cent. dividends were being paid, it was deemed advisable to make the exchange. In consummating the transaction the stock of the Southern Pacific Company was valued at par, the Common Stock of the Baltimore and Ohio Railroad Company at the same figure, while the four per cent. Preferred Stock of the latter Company was valued at $80 per share, which was its approximate market value. This accounts for the reduction in the par value of the investment, although the Company will on the basis of the present dividends receive greater returns from the ownership of the Southern Pacific Company Stock, and also have a security that can either be sold when conditions permit, or held as an investment, as may be deemed the most advantageous to your Company. During the year the Norfolk and Western Railway Company issued its Convertible 10/25 year 4½ per cent. Bonds and your Company as a shareholder subscribed for its share of the allotment, amounting to $4,793,000 par value. Your Company acquired the capital stock of the Cornwall and Lebanon Railroad 22 miles long, which connects your Philadelphia Division at Conewago with the manufacturing town of Lebanon, Pa.

The securities held by the Company, December 31st, 1913, at a valuation of $333,960,825 produced a direct income during the year of $14,940,670.

By order of the Board,

SAMUEL REA,
President.

STOCKHOLDERS MAY OBTAIN COPIES OF THE ANNUAL REPORT COMPLETE, BY APPLYING TO OR ADDRESSING

LEWIS NEILSON, SECRETARY,

BROAD STREET STATION, PHILADELPHIA, PA.